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# USSR Report

AGRICULTURE

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4 April 1984

# USSR REPORT

## AGRICULTURE

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## MAJOR CROP PROGRESS AND WEATHER REPORTING

### PREPARATIONS FOR 1984 GRAIN CROP IN CENTRAL CHERNOZEM ZONE

Moscow SEL'SKAYA ZHIZN' in Russian 9 Aug 83 p 2

[Article by A. Trubnikov, agronomist, Kursk: "The Primary Grain in the Chernozem"]

[Text] Right now in the Central Chernozem Zone you probably could not find an agricultural worker who would doubt the advantages of winter crops. In any oblast, rayon or enterprise they are more productive than spring crops. In Belgorod Oblast, for example, during the last 7 years the average yield of winter crops was 26 quintals per hectare; of barley--19. And is it possible not to consider advantages of winter crops such as the earlier harvesting schedule, hardiness with regard to the shedding of seed from the plant, and finally the possibility of having the best predecessor for sugar beets and other crops?

Many leading enterprises and rayons have examples of the skilful use of the advantages of winter crops. The farmers of Rakityanskiy Rayon produce the largest grain harvests not only in Belgorod Oblast. Here a decisive role is played by the high degree of productivity of winter crops, which comprise half of all grain crops. During the past season almost 37 quintals of winter wheat per hectare were harvested.

The senior agronomist of the rayon agricultural administration, I. N. Shkilev, tells us how this was done:

"First of all concern was shown for good predecessors; 40 tons of organic fertilizer per hectare were applied with plowing. About one-third of winter crops are planted on such fields. In fields for peas for seed and corn for silage the soil was prepared using the non-mouldboard method. During sowing fertilizer was applied in the rows. Only first-class seed of highly productive varieties was sown."

Winter crops "work" with a high return in Belgorodskiy and Shebekinskiy rayons of Belgorod Oblast, in Belovskiy and Korenevskiy rayons of Kursk Oblast, in Dobrinskiy and Usmanskii rayons of Lipetsk Oblast and in Zherdevskiy and Mordovskiy rayons of Tambov Oblast. Many enterprises here harvest 40 and more quintals of grain per hectare.

Recently we travelled through the fields and examined the crops with pleasure along with the senior agronomist of the Kursk Kolkhoz imeni Pervyy May, N. S. Logachev. We were especially gladdened by the fields of winter wheat. But in the neighboring Put' Lenina Kolkhoz winter grains were weak. The reason for the contrast is the different levels of agrotechnology.

In natural fertility the fields in the Put' Lenina are better than those of the neighbors (78 points against 74). The attitude toward the soil here is different. In the Kolkhoz imeni Pervyy May all winter crops were sown after good predecessors, whereas the neighbors sowed a significant portion after grains. The difference between these two enterprises is noticeable with regard to schedules and quality of plowing and cultivating fallow, sowing, class and reproduction of seed. Farmers from the Pervyy May apply 60 tons of manure on each of 300 hectares, but the neighbors apply only 40 tons per hectare on an area that is six times smaller.

The cultivation of winter crops after poor predecessors results in considerable losses. In Kursk Oblast, for example, 110,000 hectares or one-fifth of the winter fields, were sown after barley. Other oblasts in the region also place winter crops after poor predecessors on significant areas. We must avoid sowing winter crops after stubble predecessors--this is the opinion of many scientists and agronomists.

"Those agronomists who sow winter crops after silage corn are also making a mistake," says the director of the agronomy division of the Belgorod Agricultural Institute and candidate of agricultural sciences, N. R. Osyka. "This can be a good predecessor only if it is harvested no later than 20 August. But in this case the content of nutrients in the feed mass decreases by 40 percent. Under the conditions of Belgorod Oblast it would be expedient to utilize corn for silage as the predecessor on about one-third of the fields. The best predecessor for winter crops remains bare fallow. Occupying second place is probably occupied fallow. However, considerable losses are incurred on winter crops if the preparations of occupied fallow for sowing are late. A tried means of accelerating this work is the use of surface cultivation. With this there is a sharp curtailment of fuel and labor expenditures and the moisture in the soil is retained better, which is particularly important in dry years. Last year the farmers of Belgorod Oblast cultivated about 200,000 hectares using the surface method."

How often we have seen this picture! Because of the delay in the pre-sowing cultivation of soil enterprises miss the optimal period for sowing winter crops, but local directors force agronomists to continue sowing operations. The argument is always the same--there is enough moisture in the soil and the weather is warm. But the late shoots hardly have time to gather strength when the weather changes abruptly; crops go into winter in a weakened state and more often than not perish by springtime.

The quality of seed affects the harvest of winter crops. In many enterprises in the zone quality still remains low. In Kursk Oblast the proportion of first-class seed has increased to only 55 percent.

A special word should be said about winter rye, the proportion of which in the zone still is not great. The proper solution was selected by Belgorod farmers, who plan to put this crop on 20-25 percent of the winter crop fields. The enterprises of Tambov Oblast are actively expanding the area in rye. Rye is more resistant to low temperatures and a number of diseases; it is less demanding of soil. Highly productive varieties such as Khar'kovskaya-78 have also appeared; on the fields of the SKhI [Agricultural institute] it yielded 35-56 quintals of grain per hectare.

Bare fallow is considered maintenance area with justification. It enables us to destroy the more troublesome weeds and to apply the full norm of organic fertilizer. If we speak of bare fallow as a predecessor for winter crops, we must say it is priceless.

Unfortunately, in a number of enterprises the movement toward bare fallow is hesitant. Even in places where it exists the attitude toward it is not always economical. The effectiveness of fallow decreases as a result of untimely or poor-quality cultivation. If, for example, one drives past the fields of Solntsevskiy and Zolotukhinskiy rayons of Kursk Oblast one sees green instead of bare fallow! The same picture can be seen in the enterprises of Borisovskiy and Prokhorovskiy rayons of Belgorod Oblast. Here insufficient quantities of organic fertilizer are applied to fallow. In the oblast even today only half of fallow lands have been approved. There are many unfertilized "maintenance fields" in other oblasts in the zone.

With a caring attitude toward winter crops, they must become a source of guaranteed harvests regardless of weather conditions. After all, in the Krasnooktyabr'skiy Sovkhoz in Kursk the yield reaches 40 and more quintals of winter wheat per hectare! During the 10th Five-Year Plan this enterprise harvested an average of 44.3 quintals of winter crops per hectare. But this type of yield can be achieved only on bare and occupied fallow while strictly following all agrotechnical principles.

The size of the harvest and the quality of the grain depend greatly on the balance and schedule for applying mineral fertilizers.

"This year dry and hot weather had a negative effect on the filling of winter wheat grain," says the chairman of the Rossiya Kolkhoz of Shebekinskiy Rayon, Belgorod Oblast, N. S. Dudnikov, "but in the fields where phosphorus fertilizer was applied during sowing and nitrogen fertilizer was applied during spring top-dressing, the grain turned out to be large and the yield comprised 46 quintals per hectare. In places where only nitrogen fertilizer was applied yield did not exceed 30 quintals."

The studies of scientists and specialists of the Kursk Oblast Agricultural Experimental Station on the effect of the schedule of top-dressing crops on lodging are very informative. It was determined that lodging could be eliminated if winter crops, sown after bare fallow, clover and peas for grain, were top-dressed with nitrogen fertilizer in two stages--the first time after the beginning of leaf tube formation (30-40 kilograms of active substance per hectare) and the second time before ear formation (60-80

kilograms). On soils with a low natural fertility and after low-value predecessors one more top-dressing application is desirable in the fall or early spring.

Blight brings great losses to the winter crop harvest and decreases seed quality. Last year a portion of the procured seed could not be used for feed purposes because of this. This sad lesson once again reminds us of the necessity to chemically treat seed with good quality.

Of course all problems cannot be solved at once. However, in preparing for winter sowing, a great deal can be done today. In Tambov and Lipetsk oblasts it is planned to decrease to a minimum the area of stubble predecessors; the farmers of Belgorod Oblast have decided to fully eliminate them. A high productivity level and a relative cleanness of seed plots will allow us to sharply improve the quality of winter crop seed today. It is very important to free fields as soon as possible of fallow-occupying crops and to organize two-shift operations for soil cultivation units. Not everywhere have sowers and other machines and machinery for chemically treating seed but put into order; insufficient quantities of chemicals have been imported. All of these are immediate tasks. Laying a firm foundation for the future harvest--this is a matter of honor for all farmers in the Chernozem Zone.

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## MAJOR CROP PROGRESS AND WEATHER REPORTING

### STATUS OF SEED FUND IN VORONEZH OBLAST

Moscow SEL'SKAYA ZHIZN' in Russian 8 Jan 84 p 1

[Article by A. Demchenko and A. Kat'kalov, Voronezh Oblast: "Special Concern for Seed"]

[Excerpts] The Chernozem plowland, just covered with snow, is cooling in the wind. There are no people in the fields and it is peaceful there, but grain farmers do not cease to show concern for the future harvest.

In the villages of Liskinskiy Rayon it became known that the rayon was the winner of oblast competition for model preparation of seed for spring. The conditions were strict--by 10 August the seed fund for winter crops had to be developed, by 14 October of last year the seed of spring crops had to be stored after being brought up to first class levels for sowing. The initiative of the soviet of the oblast agro-industrial association and the oblast committee of trade union workers in agriculture brought satisfying results. Today oblast enterprises have the best seed in the RSFSR. In comparison with 1982 the quantity of first class seed has doubled, comprising 75 percent of the total.

There are good seed funds in the enterprises of Kashirskiy, Rep'yevskiy, Talovskiy, Anninskiy and several other rayons.

Undoubtedly, a great deal of work has been done in the oblast. Unfortunately, this is not true everywhere. Hiding behind the backs of leaders are those who lag behind, who have not really begun to prepare for the coming spring. We are speaking in particular about the enterprises of Povorinskiy, Kantemirovskiy, Paninskiy, Bogucharskiy and Petropavlovskiy rayons. At the present time there is less first-class seed here than in other rayons in the oblast.

The status of chemical treatment of sowing material is not good. The sad lesson of the past year, when many grain fields were infected with blight, was not learned by, first of all, the specialists of Semilukskiy, Khokhol'skiy and Novousmanskiy rayons. Sunflowers require more attention. Whereas in Ostrogozhskiy, Ol'khovatskiy and Kashirskiy rayons their seed has already been brought to first-class condition, in Borisoglebskiy, Buturlinovskiy and a number of other rayons many batches are weed infested and infected with white and grey blight.

Preparing selected seed grain for spring and carefully preserving it means taking a firm step forward along the path toward a large harvest.

## MAJOR CROP PROGRESS AND WEATHER REPORTING

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### SELECTION WORK ON WINTER WHEAT REPORTED

Moscow ZASHCHITA RASTENIY in Russian No 11, Nov 83 p 15

[Article by V. G. Novokhatka, senior scientific associate of the Mironov Scientific Research Institute of Selection and Seed Growing for Wheat: "Resistance of Winter Wheat to Cercosporiellosis"]

[Text] During the past decade in the forest steppe zone of the Ukraine there have been considerable changes in the structure of the planted areas, the composition of regionalized strains and the system of seed growing; the application of mineral fertilizers and chemical means of plant protection has expanded; and the art of farming has advanced considerably, which has led to an increase in the gross yield of grain. But these conditions cannot but affect the composition of pathogens and harmful insects as well as the traditional agrobiocoenotic ties. There has been a considerable reduction of the frequency and force of epiphytotic rust diseases, but the harm caused by powdery mildew, diseases of the spikes and root rot have increased.

Cercosporiellosis is causing a great deal of damage to winter wheat. In plants that are affected by it there is a considerable reduction of the overall and productive bushiness, the length of the stalk and spike, and the number of kernels in the spike. With a severe infection (3 points) the weight of the grain from one plant of Mironovskaya 808 decreased from 3.7 to 0.7 grams, and the weight of 1,000 seeds -- from 31.8 to 19.3 grams. Outbursts of cercosporiellosis are becoming more frequent in our zone: during the past 8 years the disease has developed to a very severe degree 5 times.

The growing harm caused by diseases has caused us to study the resistance of various strains and collection samples to cercosporiellosis, and then also the resistance of prospective winter wheat selection material. More than 1,000 selection numbers from competitive strain testing were evaluated in terms of this indicator, and also 1,700 strain specimens from the world collection of winter wheat of the All-Union Scientific Research Institute of Plant Growing.

The program of work for selection for resistance to cercosporiellosis has now been expanded considerably. From the hybrid population, KM-351, which was transferred to us from Czechoslovakia and is a hybrid from triple crossing



(NS984 X Kavkaz) X Roazon, through subsequent selection on a provocation background, forms with a certain resistance to cercosporellosis were isolated. This year 12 of them were sent to several selection institutions located in the south of the country since the material does not yet have high winter hardiness. The plans for further research include obtaining forms which will not only be resistant to cercosporellosis, but will also have other useful biological and economic traits.

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## MAJOR CROP PROGRESS AND WEATHER REPORTING

### PREPARATIONS MADE FOR WINTER CROPS

Kiev PRAVDA UKRAINY in Russian 20 Jul 83 p 1

[Article: "The Main Grain--Winter Crops"]

[Text] It has been known for ages that no sooner does the frenzy of the harvest die down than grain from the new harvest is turning the threshing floors gold, and the farmers' thoughts are again in the furrows, following the seeders. His thoughts and concerns are for the future grain harvest. What must be done and what devices must be used in order for it to be a generous one in spite of the caprices of the weather? Everything must be taken into account, everything must be checked -- right down to the smallest details -- before placing the seeds in the soil.

Most of the grain in our republic comes from winter crops. They have greater resistance to unfavorable weather factors, and even under drought conditions they produce larger yields than spring crops do. This is why it is necessary to assign the best areas to them, to be concerned about the most careful preparation of the soil, and to treat them with abundant quantities of fertilizers.

As we know, the republic has developed zonal and oblast farming systems and tested them in practice. They are not rigid dogmas, however, but require a creative approach, constant improvement of agrotechnical devices, and flexible accounting for situations that arise. For example, one of the peculiarities of this year is earlier ripening and, consequently, earlier harvest times for the majority of agricultural crops. This makes it possible to prepare the soil at the best times for planting winter crops and to essentially improve its agrotechnical condition. And machine operators, specialists and managers of farms must exert maximum efforts in order to take full advantage of this opportunity.

This year two-thirds of the winter crops are to be planted on clean and occupied fallow, after peas, perennial grasses and corn for silage, and stubble predecessors are to be reduced to a minimum. All this should have a favorable effect on the future yield. Of course, this is under the condition that the farmers do everything possible to accumulate and retain a maximum quantity of moisture in the planting layer of the soil. This is why it is so

important to use the soil-protective system of cultivation on a large scale in the steppe and southeast forest steppe zones. Experience is skillful and creative application of this system has been accumulated in Poltava Oblast, and on the majority of farms of Cherkassy, Nikolayev and other oblasts.

In Bobrinetskiy Rayon in Kirovograd Oblast winter crops occupy 40,000 hectares this year. It is intended to use subsoil tilling on 22,000 hectares. Moreover, specialists of the RAPO [rayon agro-industrial association] have calculated that the subsoil method makes it possible to prepare all the soil for winter crops 30-35 days before the beginning of planting. And this alone promises a significant additional yield. Surface cultivation is done extensively on the kolkhozes imeni Dzerzhinskiy, imeni XXI s"yezda KPSS, imeni Shevchenko and others of this area, especially on clean fallow, after which they plant most of the strong and valuable wheats.

And here is another bit of information. On the Kommunar Sovkhoz in Belozerskiy Rayon in Kherson Oblast the winter crops are being cultivated mainly by the subsoil method. First they go over the areas twice to loosen the soil. Then, when the weeds have sprouted, they used the subsoil tillers combined with tooth harrows.

One can give many examples like these of thoughtful, truly businesslike concern for the future. Of course in each specific case, based on the existing situation and taking into account the experience that has been accumulated, one must determine clearly beforehand where to apply subsoil tilling and where to use plows. But in any case, after the main cultivation it is necessary to bring the surface layer of soil up to a condition that is suitable for planting. To provide for carrying out this agrotechnical device on a high level everywhere is the primary responsibility of RAPO specialists as well as kolkhoz and sovkhoz specialists.

The rates of preparation of areas for winter crops are considerably higher this year than they were last year, especially in Donetsk, Voroshilovgrad, Kirovograd, Odessa, Nikolayev and Kherson oblasts. On the whole things are going fairly well in Kharkhov Oblast too. But still on many farms of Zachepilovski, Kegichevskiy and a number of other rayons of the oblast the schedules for cultivating the soil are not being met and the productivity of the technical equipment being used for this work is not high.

One cannot put up with cases like this, and, unfortunately, they are to be found in other oblasts as well. Rayon party committees and RAPO's must establish the strictest control over the entire complex of work related to the future grain crops.

The time during the periods of preparation for planting and the planting itself is as significant as the harvest is. If the best time periods are missed, one can count on failing to receive some of the harvest. And in order not to allow this, it is necessary to achieve everywhere 24-hour and high-quality utilization of soil cultivation equipment and to assign more responsible operations to the most skilled and the most experienced machine operators.

The fate of the 1984 harvest will depend to a decisive degree on the quality of the seeds and their varietal composition. It is the immediate duty of specialists to take full advantage of all possibilities of accelerated propagation of such highly productive strains which are resistant to changes in the weather as Odesskaya Polukarlikovaya, Polukarlikovaya-49 and Parus.

Now, along with the harvest, one should devote the most constant attention to the preparation of the seed supply and its quality. This work cannot be forgotten even for one day by specialists and managers of farms and agricultural agencies or agricultural agencies. One can give many examples of a painstaking approach to the organization of this work. In Zaporozhye Oblast, for example, the majority of kolkhozes and sovkhozes have already dealt with the preparation of the seeds of winter crops. And in the southern zones the seed supplies are being augmented because of interfarm and interrayon exchanges which have been organized by rayon and oblast agro-industrial associations. This experience deserves all-around approval and extensive emulation. At the same time it should be noted that in Priazovskiy and Novonikolayevskiy rayons the rates of preparation of the seeds are lower than the average for the oblast. It seems that the local agricultural agencies can rectify this situation.

As with the harvest, a great effect during plowing and planting is produced by the work of consolidated detachments who work by the Ipatovo method. Therefore it is necessary everywhere to borrow the experience of the farms of Nikolayev and Odessa oblasts and the central and northern zones of the republic, where the technical equipment very efficiently and the earnings of each worker are directly dependent on the quantity and quality of work done by the entire collective. Here one must not forget about the moral incentives for workers, the development of effective socialist competition among them, well-arranged technical support and cultural and domestic service for the people.

This entire group of issues should be constantly in the field of vision of local party agencies and organizations. Their efforts, like the efforts of the farmers, should serve the main goal which was dictated by the Food Program --to provide for a steady growth of grain production.

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## MAJOR CROP PROGRESS AND WEATHER REPORTING

### BRIEFS

MOISTURE ACCUMULATED--Lipetsk, 31 Jan 84--After the recent snowfall all of the enterprises of Khlevenskiy Rayon have machine operators cutting snow windrows. [G. Kolenchuk] [Excerpts] [Moscow SEL'SKAYA ZHIZN' in Russian 1 Feb 84 p 1] 8228

SNOW RETENTION--For a long time there has been no real winter on the lands of Voronezh. Only during the beginning of the last 10 days of January did it begin to snow over the bare fields. Good managers immediately began snow retention operations. [A. Pyatunin] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 31 Jan 84 p 1] 8228

SEED PREPARATIONS COMPLETE--Penza--The kolkhozes and sovkhoses of the oblast have completed preparations of grain crop seed for spring. They fit into the first and second class categories of the sowing standard. Farmers are focusing on expanding the area in high-yield varieties that produce a full-weight ear on Penza lands even under unfavorable weather conditions. These include Kutulukskaya spring wheat, Gorizont oats, Nosovskiy barley and Mironovskoye millet. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Jan 84 p 1] 8228

WINTER CROPS SOWN--Lipetsk--The sowing of winter crops on the oblast's fields has been completed in the best agrotechnical time. Sown were the high-yield Moskovskaya-35 rye and Mironovskaya-808 wheat varieties. [Text] [Moscow TRUD in Russian 18 Sep 83 p 1] 8228

MORE WINTER CROPS SOWN--Belgorod--The oblast's farmers have completed the sowing of winter crops, which are located on an area of 445,000 hectares, in the best agrotechnical time. Agricultural workers are giving a great deal of attention to work quality. Seed is placed into the ground with the simultaneous application of fertilizer. [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 16 Sep 83 p 1] 8228

WINTER WHEAT VARIETIES--In Voronezh Oblast the winter crop field occupies about 750,000-800,000 hectares. Since 1978 the main winter wheat variety sown here has been the regionalized, valuable and intensive Severodonskaya. On small areas the Krasnodarskaya-39, Mironovskaya-808 and new variety Tarasovskaya-29 are also sown. [Text] [Krasnodar SEL'SKIYE ZORI in Russian No 9, Sep 83 p 17] [COPYRIGHT: "Sel'skiye zori", 1983] 8228



PREPARATIONS FOR SPRING--Kiev--Farmers of the Ukraine are laying a solid basis for next year's crops. Workers of Khmel'nik Oblast have finished checking the quality of the seeds of grain and pulse crops. Almost all of the planting material has been brought up to the highest conditions. The preparation of seeds on the farms of the republic has been assigned to specialized brigades and teams. Collectives of more than 40 plants of the Sortsemprom USSR Association are working side by side with them. Each of them produces 25,000-50,000 quintals of products per season. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 28 Nov 83 p 1] 11772

RAPE PLANTING--Odessa--Unusually warm weather has come to the Black Sea area. The mercury has reached 12-13 degrees. Machine operators of many farms have taken advantage of the "windows" in the winter and begun to harrow the soil. [Excerpt] [Moscow SEL'SKAYA ZHIZN' in Russian 8 Jan 84 p 1] 11772

'GOLD' CULTIVATION--Kiev Oblast--The frequent rains have made harvesting grain crops more complicated. But regardless of the efforts required by the harvest, grain growers of Stavishchenskiy Rayon are filled with concern about the future crop. Therefore the preparation of the soil is constantly in the field of vision of the staff for managing the harvest. A task has been set in Stavishchenskiy Rayon this year: to cultivate all plowed fields immediately, literally right after the plows have passed. Of course it is not easy to release tractors for this at such a busy time as the present. But they have located all the machines and are trying to give them a maximum load. This is being encouraged in all ways. Both science and practice convincingly show that the yield decreases by 4-5 quintals per hectare when the preparation of the soil is delayed. But it is no less important to perform the work intelligently, accounting for specific conditions. For example, for several years workers in the rayon have not been plowing fields where the predecessors were peas or corn for green feed -- they have been limiting themselves to surface cultivation. The areas that have been planted in grasses and corn for silage are not plowed, but they must be gone over with a cultivator. To "pair up" cultivators with plows everywhere -- this is a task that has been set for the farms. And the majority of sovkhozes are doing this. But not everywhere. There is still the opinion that cultivation can be put off -- they say they have more important things to do. In these cases both the party raykom and the RAPO council intervene actively and force the agronomical services to perform the entire complex of work on time. Winter crops have been planted on 12,600 hectares this year. And in order for each hectare to be used fully, in the rayon the cultivation of the soil for winter planting is being carried out strictly in keeping with the requirements of agrotechnology, and stubble predecessors are being eliminated completely. [Excerpts] [Kiev PRAVDA UKRAINY in Russian 10 Aug 83 p 1] 11772

WINTER CROPS--Along with harvesting late crops, the kolkhozes and sovkhozes of Voroshilovgrad Oblast are hard at plowing the fields for winter crops. Almost all the areas intended for winter planting are ready on the farms of Belokravinskiy, Belovodskiy and Markovskiy rayons. It is also important that this year 64 percent of the winter crops will be planted on clean and occupied fallow and areas which had been planted in pulse crops, and approximately 30 percent of them will be planted after corn harvested for silage. Only 4



percent of the winter crops will be planted after stubble predecessors. The rayons of the oblast have been planted with seeds, of which 72 percent are in the first class, and in Stanichno-Luganskiv. Starobel'skiy and Kremenskiy rayons actually all the seeds are of the first class. They will plant the Odesskaya-51, Severodonetskaya, Tarasovskaya-29 and other strains which have been regionalized in the oblast. [Text] [Kiev PRAVDA UKRAINY in Russian 25 Aug 83 p 1] 11772

FALLOW PLOWING--Machine operators of Poltava Oblast are plowing the fallow much more rapidly this year than they did last year. They have already prepared 550,000 hectares for spring planting -- two-thirds of the planned amount. They have also conducted semifallow cultivation with cultivators on all of this area. About 800 mechanized detachments and teams were promptly created for plowing the fallow. The use of subsoil equipment everywhere, which doubles labor productivity, and 24-hour utilization of machinery with the watch method make it possible for machine operators to overfulfill their assignments and provide for high quality of the work. [Text] [Kiev PRAVDA VOSTOKA in Russian 14 Sep 83 p 1] 11772

SPRING PLANTING--Kirovograd--Preparing all areas for spring planting in the autumn has become the rule for farmers of the oblast. They have already plowed the fallow on 400,000 hectares. This is almost half of the area that has been allotted and twice as much as was cultivated by this time last year. The sets of plowing equipment are being used on two shifts. [Text] [Moscow GUDOK in Russian 24 Sep 83 p 1] 11772

CORN FIELDS--Kirovograd--The last combines had not left the corn fields of the oblast, which occupy 147,000 hectares this year, before the corn growers began to be concerned about the next crop. A message was sent to all workers and services of the agro-industrial complex concerning the initiation of a collective campaign for a large corn yield in the final stage of the 11th Five-Year Plan and all-around organizational and material-technical support for it. They are relying on six decisive factors: agricultural devices, technology, seeds, fertilizers, machines and personnel. A great deal of attention is being devoted to active introduction of advanced practice. [Excerpts] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Oct 83 p 1] 11772

INCREASED CORN PRODUCTION--Odessa Oblast--This autumn has one peculiarity. Productive precipitation has not fallen for a long time in the majority of rayons of the oblast. And this has made adjustments to the farmers' work plans. "Now most of the field work will have to be done in the spring," says the chairman of the Odessa Oblispolkom, V. F. Pokhodin. "The farm workers intend to produce more than 3 million tons of grain in 1984. They are placing all their hopes in spring crops and primarily in corn." At a conference of agricultural workers held recently in Odessa it was decided to increase the area planted in corn to 320,000 hectares and to increase the gross yield of corn to 1 million tons. The areas planted in spring barley, millet and peas are also to be expanded. As a result of this, the volume of spring field work will increase considerably. How can it be done in shorter periods of time? One cannot count on acquiring additional technical equipment. This means that it is necessary to utilize existing equipment better. This is why all the

farms are striving to do most of the work for preparing the soil now. The machine operators are levelling the soil, loosening it and treating it with fertilizers. This will make it possible in the spring, as soon as the soil ripens, to begin planting spring crops immediately. But this can be done only if the machines are prepared reliably and promptly. And a task has been set in the oblast: to repair all technical equipment comprehensively, leaving nothing for later. The cold weather began in the second half of November in the Black Sea area. But this does not hamper the repair workers. Hard work is in progress in the shops of the kolkhozes, sovkhozes and rayon Sel'khoztekhnika associations. The machine operators know that spring will not wait, and they are doing everything possible for a successful beginning of field work. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 20 Nov 83 p 1] 11772

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## LIVESTOCK

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### USE OF MODERN TECHNOLOGY IN HOG RAISING DISCUSSED

Moscow SVINOVODSTVO in Russian No 2, Feb 84 pp 2-6

/Article by P. Korneyev, chief of the Main Administration of Animal Husbandry of the USSR Ministry of Agriculture: "Tasks Concerning the Development of Hog Raising"/

/Text/ In accordance with the Food Program by 1985 it is necessary to ensure pork production in the volume of 6.5 million tons, or to increase it by 14 percent during the remaining 2 years. During the 12th Five-Year Plan the task will be even more complex, because pork production should be increased to 7 or 7.3 million tons.

The sector's intensification through an improvement in herd reproduction, raising and fattening of animals and increase in stock preservation, which depends to a significant extent on the conditions of hog feeding and keeping and the level of selection work and labor organization, should become the basis for a rise in pork production.

The material and technical base has been strengthened considerably and the sector's provision with mechanization equipment has risen in hog raising, as in poultry breeding, in the last few years. The proportion of capital structures for hogs comprises 93 percent and overall mechanization encompasses 66 percent of the stock.

All this creates the necessary conditions for an extensive introduction of industrial technology not only at newly built enterprises, but also at the reconstructed hog raising sections of kolkhozes and sovkhozes.

We include the following in the concept of industrial technology: the flow nature, regularity and continuity of all technological processes, uniformity of production groups of animals, their formation within a strictly determined period, shop organization of labor and collective contract.

Practice shows that the introduction of the flow system of pork production through the reconstruction, expansion and technical retooling of existing sections makes it possible to more efficiently utilize capital investments as a result of the decrease in expenditures on engineering networks and structures, public services and amenities, housing and cultural-domestic

projects. It makes it possible to utilize local building materials and the economic method in construction. The fact that the reconstruction and expansion of sections can be carried out in stages, steadily increasing pork production, is also of definite significance.

Definite results have been obtained in this work in the last 3 years. The number of farms using flow technology increased from 2,853 to 4,787 and the number of hogs on them rose from 25.4 million to 33.8 million head. The production of pork in live weight increased from 2.1 million to 2.6 million tons.

Farms transferred to flow pork production technology comprise 64 percent in the Russian Federation, 53 percent in the Ukrainian SSR, 67 percent in the Belorussian SSR, 63 percent in the Kazakh SSR, 56 percent in the Lithuanian SSR, 86 percent in the Moldavian SSR, 89 percent in the Latvian SSR and 95 percent in the Estonian SSR.

The flow system is most systematically introduced through the reconstruction and expansion of sections in the Estonian SSR.

Here pork (90 percent) is produced at the sections of kolkhozes and sovkhoses that, basically, have a completed production cycle and an annual capacity of 400 to 600 tons of pork. Locally produced feed comprises 75 percent of the ration. Hog raising accounts for 48 percent of the meat procurement and for almost one-third of all the income.

In the republic 17.5 to 18 hoglings per basic sow are stably obtained annually, the average daily gain during fattening is 450 grams and, at the same time, feed consumption per quintal of gain is 5 to 6 quintals of feed units and labor expenditures amount to 10 man-hours. A total of 112 to 118 kg of pork per transitional head are produced.

On the Vykhandu Kolkhoz in Vyruskiy Rayon, as a result of the reconstruction of the hog raising section and the introduction of advanced technology, gross production increased from 248 tons in 1975 to 374 tons in 1982, or 1.5-fold, the average daily gain in hogs more than 2 months old increased from 475 to 534 grams and labor expenditures per quintal of gain were reduced from 15.7 to 9 man-hours. In 1982 feed consumption per quintal of gain was 5.4 feed units and profitability comprised 83.9 percent. The Lasva Sovkhoz, the Myary-amaa Sovkhoz, the Tyrva Sovkhoz, the Sovkhoz imeni V. Sassi, the Saad'yarve Kolkhoz and the Kayu Kolkhoz attain high production results. It must be noted that flow technology has also proved its value at the pedigree sections of kolkhozes and sovkhoses in the Estonian SSR.

There are also positive examples of the introduction of the flow system of pork production on farms in other republics.

For example, five hog breeding houses and six fattening houses were reconstructed on the Severnyy Klyuch Sovkhoz in Kuybyshev Oblast. This made it possible to increase the number of hogs from 23,000 to 29,000 head, offspring production from 26,500 to 39,500 respectively and pork production from 1,800 to 3,700 tons in live weight. The average daily gain in fattening hogs rose from 319 to 534 grams, feed consumption per quintal of gain was lowered from 16.8 to 11 quintals of feed units and labor expenditures were reduced from 16.8 to 11 man-hours.

The Taganrogskiy Sovkhoz in Rostov Oblast operates efficiently with flow technology. The farm annually obtains more than 20,000 hoglings, including 1,800 hoglings per 100 basic sows, sells 1,500 to 1,600 tons of pork to the state and its profit from hog raising totals 1.2 to 1.3 million rubles. The flow system is used successfully at the pedigree plant of the Kavkaz Kolkhoz in Kurganinskiy Rayon, Krasnodar Kray, on the Nazarovskiy Sovkhoz in Krasnoyarsk Kray and on many other farms in the Russian Federation.

On the Rossiya Kolkhoz in Volnovakhskiy Rayon, Donetsk Oblast, the Ukrainian SSR, as a result of the reconstruction and expansion of the section, the number of hogs increased from 8,000 to 16,400 head, pork production, from 700 to 1,610 tons and the yield of hoglings per 100 basic sows, from 1,500 to 2,224 head.

On the Oktyabr' Sovkhoz in Kokchetav Oblast, the Kazakh SSR, during the period from 1976 to 1982 the hog stock doubled, pork production increased 2.2-fold and the yield of hoglings per 100 basic sows, from 1,333 to 2,218 head and labor expenditures were lowered by a factor of 1.7 and feed consumption, of 1.6. The unprofitable farm became profitable. Profit totaling 1.2 million rubles was obtained in 1982.

On the Baryunay Kolkhoz in Ionishkskiy Rayon, the Lithuanian SSR, before the section's reconstruction there were 2,850 hogs, while now more than 4,100 head are kept, the production of offspring increased 1.7-fold, in 1982 the average daily gain in fattening hogs was 549 grams, feed consumption per quintal of gain, 5.8 quintals of feed units and labor expenditures amounted to 10 man-hours.

On kolkhozes and sovkhoses in the Latvian SSR flow technology made it possible to increase the rate of turnover of stalls in hog breeding houses to 4.8 times annually and on the best farms to obtain 7 to 8 farrows and 60 to 70 hoglings per stall. On the Vishskiy Tekhnikum-Sovkhoz in Daugavpilskiy Rayon in 1982 1,404 tons of pork were produced, feed consumption per quintal of gain was 4.5 quintals of feed units and labor expenditures amounted to 5.9 man-hours.

Flow technology in hog raising can be used successfully not only at complexes and large sections, but also at average sections with an annual production volume of 200 to 400 tons of pork. The Iskra Kolkhoz in Mostovskiy Rayon, Grodno Oblast, uses the flow system of pork production, having about 1,800 hogs. The farm obtains more than 50 hoglings per stall annually and 18 to 20 hoglings per basic sow and the average daily gain exceeds 400 grams.

The advantages of the flow system of pork production are obvious. Meanwhile, individual kolkhozes and sovkhoses introduce extremely slow advanced technology at existing sections. In the Uzbek SSR only 4 out of 15 farms having a stock of more than 3,000 hogs operate with flow technology, in the Georgian SSR, 1 out of 13 and in the Kirghiz SSR, 2 out of 24.

The certification and preparation of plans for the reconstruction of sections are not organized satisfactorily in individual oblasts of the Russian Federation, the Ukraine and Kazakhstan. The republic's agricultural bodies should place problems of certification of hog raising sections and the development



of plans for their reconstruction under unabated control. It is necessary to allocate building materials and equipment primarily for the reconstructed sections, where the flow system of pork production is being introduced.

In our country along with the organization of hog raising at industrial sections and complexes great significance is attached to an increase in pork production at the sections of nonspecialized kolkhozes and sovkhozes and on the subsidiary farms of enterprises and organizations, which is a major potential for the replenishment of meat resources.

On 1 January 1983 a total of 23,000 kolkhozes, sovkhozes and interfarm enterprises had hog raising sections. During 1977-1982 hog raising was restored and reorganized on 8,166 farms. In the Ukrainian, Lithuanian, Moldavian, Latvian and Estonian Union republics, in the Mari, Chuvash and Udmurt autonomous republics and in Orel, Yaroslavl, Belgorod, Kursk and Rostov oblasts 95 to 98 percent of the farms have hog raising sections.

However, in the Armenian SSR, the Kirghiz SSR, the Tajik SSR, the Azerbaijan SSR, the Uzbek SSR, the Kazakh SSR and a number of oblasts in the RSFSR hog raising sections are restored slowly and in some cases, for example, in the Kazakh SSR and Altay Kray the number of these sections is even reduced.

All this occurs, because, as a rule, on nonspecialized and subsidiary farms the sector is managed according to the old method. There is only one way out, that is, to introduce advanced technology extensively. Experience shows that the section with a complete turnover of a herd of 50 sows and the production of no less than 1,000 hoglings is the optimal variant for nonspecialized and subsidiary farms. With smaller volumes it is advisable to have only fattening stock on the farm. Specialized reproducer sections should produce young stock for these farms, as well as for the sale of hoglings to the population.

Dobelskiy Rayon in the Latvian SSR, where there are two large specialized reproducers on the Kronautse Sovkhoz and on the Dobelevskiy Sovkhoz of an annual capacity of 30,000 to 35,000 hoglings, can serve as an example. In addition to supplying young stock to fattening complexes, these reproducers sell it to other farms in the rayon. In 1982 the Kronautse Sovkhoz sold 14,040 hoglings to 10 sovkhozes and kolkhozes in the rayon and the Dobelevskiy Sovkhoz, 8,341 hoglings to seven farms in the rayon. Furthermore, these farms sell about 3,000 hoglings annually to the population. Interpedigree crossing is used at reproducers and hog raising on these farms is profitable.

In Yygevaskiy Rayon in the Latvian SSR the interkolkhoz combine and the Ke-vade Kolkhoz sell 21,000 hoglings to 10 farms in the rayon and 3,100 head to the population.

There are also similar reproducers in a number of other republics. The Ras-svet Kolkhoz in Ostrovetskiy Rayon, Grodno Oblast, annually transfers 2,600 to 2,800 head to a fattening specialized farm and 2,300 to 2,500 head, to non-specialized farms and the population.



Despite the advantages of such cooperation specialized reproducers are established slowly.

It is well known that the production of hoglings requires higher expenditures of labor and funds and balanced feed as compared with hog fattening. Therefore, along with the efficient organization of production processes and labor aimed at a reduction in these expenditures, local agricultural bodies must regulate the prices of the sold young stock so that reproducer farms may operate profitably, as is done in the Baltic Republics and the BSSR.

Under the conditions of industrial technology, including at large complexes, placing hogs in camps for the summer period is an important technological method. Summer camps serve as an additional potential for pork production with cheap feed and for hogling production and make it possible to carry out the capital repair and reconstruction of sections without a disruption of the technological rhythm, to sanitize premises under optimal conditions and to increase the productivity of animals.

Positive experience in the utilization of summer camps has been accumulated in the country. Farms in the Russian Federation take out more than 40 percent of the breeding stock to camps. In the Lithuanian SSR all pedigree sections and 70 percent of the commodity farms have summer camps. The camp keeping of hogs is widely used on farms in the Belorussian SSR and the Latvian SSR. At the same time, the summer camp keeping of hogs is not organized sufficiently in the Ukrainian SSR, the Moldavian SSR and the Kazakh SSR. The experience of advanced farms shows that all pedigree and reproducer sections, regardless of their capacity, should mandatorily have summer camps. They also have a positive effect on commodity farms.

The level of selection work and the rapid realization of the achievements of pedigree hog raising in commodity herds is of great importance for the sector's intensification. The country's pedigree base has hundreds of pedigree plants, pedigree sovkhoses and pedigree sections, on which animals of 24 breeds and of 8 pedigree groups and types are raised.

The pedigree network is unevenly distributed throughout the country's zones, some pedigree plants and pedigree sovkhoses have a weak feed base and are poorly staffed and their specialization is disrupted. The certification of pedigree farms conducted in 1980-1981 showed that the level of selection-pedigree work on many of them did not meet the higher requirements and insufficient attention was paid to the evaluation of the young replacement stock according to its productivity and of boars according to the quality of offspring, to immunogenetic control and to a check for stress resistance.

A total of 66 percent of the certified pedigree plants were placed in the first category and 29, in the second. Only 40 percent of the pedigree sovkhoses were placed in the first category. In the Moldavian SSR 14 percent of the pedigree hog raising farms were placed in the first category and in the Belorussian SSR, 18 percent.

There are serious shortcomings in the organization of pedigree work in a number of oblasts in the Russian Federation, the Ukraine and Kazakhstan. A decline in the productivity indicators of animals is observed on such pedigree farms as Otrada and Pal'na-Mikhaylovskiy in Lipetsk Oblast, Stary Kovray in Cherkassy Oblast, Zhoten' in Poltava Oblast and some others.

Two new breeds--the Belorussian black-and-white and the Semirechye--two intra-pedigree types in the large white breed--the Belorussian and the Estonian--and four new plant types of meat hogs have been approved in the country in recent years. The development of new types and lines of hogs is continuing. Work on the development of a new meat breed of hogs is now carried out in the country. A total of 11 scientific research and educational institutes and 48 farms in the country's various zones are engaged in it. A successful fulfillment of the selection program will largely depend on local agricultural bodies and on understanding the importance of the solution of this problem.

Local agricultural bodies and workers of the pedigree service and selection centers must take additional measures to strengthen the pedigree base in every republic and to improve the management of their activity.

For the realization of selection achievements in hog raising oblast, kray and republic systems of hog breeding have been developed. They should ensure the differentiation of farms and the planned execution of interpedigree crossing and hybridization. This method is used by more than 12,000 farms, which obtain about 30 million head of crossbred and hybrid stock. In accordance with the developed program the production of crossbred and hybrid young stock should total 62 million head.

The selection-hybrid center of the Povolzhskiy Complex in Kuybyshev Oblast has now been put into operation and selection-hybrid centers are planned in Dnepropetrovsk and Gorkiy oblasts. Practical work on the implementation of hybridization programs is done in the Omskiy Bekon Association in Omsk Oblast, the Novyy Svet Association in Leningrad Oblast, the Belorussian Scientific Research Institute of Animal Husbandry and the Progress Scientific Production Association in the Moldavian SSR.

However, in most oblasts zonal breeding systems are introduced slowly. The plans for the organization of a pedigree network and for the production of hybrid young stock are not fulfilled and the scientific and methodological management of this work on the part of selection centers and scientific research institutes is carried out poorly.

The artificial insemination of hogs is of great importance for the sector's intensification, for the most rapid introduction of selection achievements into commodity hog raising and for the improvement in qualitative indicators.

This method is successfully used on farms in Krasnodar Kray, where more than 300,000 hogs of the breeding stock are inseminated artificially, in Rostov Oblast--164,000 head--and in Lipetsk and Belgorod oblasts--130,000 head in each.

However, in many oblasts the artificial insemination of hogs is not yet applied extensively. In 1982 a total of 27 percent of the sows and young hogs were artificially inseminated throughout the country, 22 percent, in the Belorussian SSR, 15 percent, in the Lithuanian SSR and 13 percent, in the Kazakh SSR. The artificial insemination of hogs is introduced poorly on farms in the Chuvash and Udmurt autonomous republics and in Orel, Novgorod, Kirov, Tambov and some other oblasts. In 9 months of last year the number of artificially inseminated sows, as compared with the corresponding period of 1982, increased by only 7 percent, which is obviously insufficient.

The underestimate of artificial insemination and the shortcomings in its organization have led to the fact that the annual load per boar in the country does not exceed 27 sows, in the Kazakh SSR, 17, in the Uzbek SSR, 14, in the Azerbaijan SSR, 14 and in the Georgian SSR, 11.

The satisfaction of the need of hogs for high-grade feed and the balance of rations in terms of basic nutrients are some of the fundamental problems of increase in the sector's intensification.

On many farms the proportion of concentrates in the rations of hogs is considerable, comprising about 85 to 90 percent. There are significant shortcomings in the technology of fodder preparation and feeding. Owing to the lack of balance of rations, feed consumption per unit of output is high.

At present, when many farms lower the proportion of concentrates, it is important to prepare well all fodder grain for feeding. It is necessary to place the construction and repair of feed shops under unabated control and to ensure their continuous and efficient operation. At the same time, in the Russian Federation there are 10,900 feed shops for 16,400 hog raising farms, in the Ukrainian SSR, 7,200 feed shops for 9,000 farms, in the Belorussian SSR, 1,800 feed shops for 2,200 farms and in the Moldavian SSR, 479 feed shops for 839 farms. However, there are also other examples. Thus, in the Lithuanian SSR there are 1,653 feed shops for 1,064 farms, in the Latvian SSR, 667 feed shops for 515 farms and in the Estonian SSR, 504 feed shops for 277 farms. To organize the continuous operation of all feed preparation equipment, especially during the current wintering period, is the very first task of local agricultural bodies.

To better utilize green, coarse and succulent fodder for hog feeding and to maximally introduce mixed silage into the ration are the primary tasks of hog breeders. Whereas in 1981 a total of 4.1 million tons of mixed silage for hogs were procured, in 1982 a total of 6.4 million tons. More than 8 million tons of mixed silage were stored for this wintering period.

This work is well organized on farms in the Mari Autonomous Republic and in Voronezh, Belgorod, Penza, Poltava and Cherkassy oblasts. At the same time, in individual zones and farms mixed silage has not become widespread. Scientific research institutes must more rapidly develop systems of feeding for various sex and age groups of hogs with due regard for zonal characteristics, which will help farm specialists to better utilize feed and to increase the productivity of hogs.

Food waste is an important additional source of feed. About 30 percent of the hog raising farms now use it in hog feeding. The collection and consumption of food waste increase constantly, totaling more than 6 million tons annually. The preparation of dry high-grade granulated feed on the basis of food waste could contribute to its more efficient utilization. However, proper initiative is not yet manifested in the localities, nor do scientific institutions give substantiated proposals.

Despite the significant work on the strengthening of hog raising, labor expenditures are still high in the sector. Whereas on kolkhozes and sovkhoses in the Estonian SSR 10 to 11 man-hours per quintal of gain are expended and there is no difference among sectors, in a number of republics labor expenditures amount to 20 man-hours and more and great fluctuations are observed between kolkhozes and sovkhoses. Meanwhile, the practice of advanced farms shows that labor expenditures per quintal of output can be lowered significantly. We have great possibilities of increasing labor productivity and, to be sure, the introduction of the flow system of pork production, of full cost accounting and of the collective contract will help in their realization.

More than 3,000 hog raising brigades and links work on the basis of the collective contract in the country, including 1,200 in the RSFSR, 300 in the Ukrainian SSR and 200 in the Lithuanian SSR.

In the Russian Federation the collective contract is successfully used on the Krasnogorskiy Sovkhoz in Chelyabinsk Oblast, the Pankratovskiy Sovkhoz in Penza Oblast, the Velikiy Oktyabr' Sovkhoz in Voronezh Oblast, the Kubanets Sovkhoz in Krasnodar Kray, the Troitskoye Interfarm Enterprise in Lipetsk Oblast and the Druzhba Interfarm Enterprise in the Chuvash ASSR.

In the Ukrainian SSR this form of labor organization is extensively used on farms in Donetsk, Chernovitsy and Zaporozhye oblasts. The collective contract is well organized on the Zarya Kommunizma Kolkhoz in Chernobayevskiy Rayon, Cherkassy Oblast, the Pobeda Kolkhoz in Pokrovskiy Rayon, Dnepropetrovsk Oblast and the Rossiya Kolkhoz in Volnovakhskiy Rayon, Donetsk Oblast. The organizational steps taken and the increase in purchase prices have had a positive effect to some extent, but agricultural bodies, managers and specialists must work more actively on improving the sector's economy.

During the current wintering period kolkhozes and sovkhoses have been better provided with feed and barns and the cultural and domestic conditions of livestock breeders have been improved. As a result, during the first months of the wintering period meat production has increased, more hogling offspring have been obtained and the hog stock population has increased. The necessary prerequisites for a successful fulfillment of meat procurement plans have been created.

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## REGIONAL DEVELOPMENT

### DEVELOPMENTS IN NONCHERNOZEM ZONE AGRICULTURE

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[From the "News From the Country's Agroindustrial Complex" program, presented by Commentator Aleksandr Ruvinskiy]

[Summary] The Nonchernozem Zone of the RSFSR includes 29 oblasts and autonomous oblasts stretching over a territory ranging from the Baltic Republics to the Urals. There are over 10,000 agricultural enterprises, kolkhozes and sovkhoses here. This zone produces one-third of the entire agricultural output of the RSFSR.

In 1974 a decision was adopted on the development of the Nonchernozem Zone. "It needs to be said that in the process of the fulfillment of this program quite a lot has already been done. According to the statistical data at hand, basic production assets have increased by 80 percent at the kolkhozes and sovkhoses of this zone."

"It must be noted that during the 3 past years of the present 5-year plan period alone, compared with the previous 5-year plan period, the productivity of fields and livestock farms and average annual purchases have considerably increased on the Nonchernozem Zone. Thus average annual purchases of grain, for instance, have increased by 7 percent, purchases of rye have even doubled, purchases of potatoes have increased by 11 percent, purchases of vegetables by 15 percent. A similar trend is also being observed in the purchases of animal husbandry produce.

"For the past 2 years the plan for the sale of grain by all autonomous republics and oblasts in the zone has been overfulfilled. And what is very important now, as the economists note, is that a turnaround toward lowering the cost of output has taken shape. The kolkhozes and sovkhoses of the Nonchernozem Zone ended 1983 with a profit of some R3 billion as a whole. Let us recall that in the previous years the majority of collective and state farms in this zone worked at a loss. But of course, the measures taken at the May plenum of the party Central Committee--that is, the Food Program--have had a considerable effect here."

"Just in the years since implementation of the 1974 decision began, 32 million square meters of housing have been built in this zone. Unfortunately, this program, too, was not completely fulfilled. This is because the funds, the capital investments, which were allocated by the state for nonproductive construction, were only 80 percent assimilated. As practice shows, production of agriculture produce and the fulfillment of the social development program are directly interdependent. This can easily be seen from the example of Sverdlovsk Oblast."

"In the last few years a tendency toward an increase in the number of workers in agriculture has taken shape in this oblast." "It should be noted that a tendency toward stabilization of the population in the countryside has now also taken shape in the zone as a whole, which means that its numbers have stopped dropping. Of course, here the effect shows primarily of the measures taken to improve living conditions in the countryside."

Sverdlovsk Oblast correspondent Jan Khutoryanskiy: "The annual volume of agricultural production here is now over R1 billion while Sverdlovsk Oblast has one third the per capita arable land of the RSFSR. Nevertheless, the oblast is self-sufficient in the production of potatoes, vegetables, and eggs. At present double the amount of capital investment, compared with the previous 5-year plan period, is being channeled into the construction of housing and social, cultural, and consumer services amenities in order to retain rural cadres. The task has been set of building 23 flats at each farm annually. At present the question of so-called unpromising villages has been taken off the agenda in Sverdlovsk Oblast. As a result, the outflow of the population from the out-of-the-way areas has ended, the contraction of cattle, or arable land and hayfields has ceased. At present substantial funds are being allocated in our oblast for strengthening small production points."

Tamara Aliyeva, correspondent for Chechno-Ingush ASSR: In the past 2 years the ASSR has boldly set out on a course of specialization in lucerne seed production, placing it on an industrial basis. Recently a lucerne scientific production association was set up in the ASSR. Last year the ASSR dispatched 900 tons of seeds. This means that the area sown to fodder lucerne can be expanded to almost 1 million hectares. Six hundred metric tons of these seeds were dispatched to the [word indistinct] areas of the Nonchernozem Zone.

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## REGIONAL DEVELOPMENT

### COMMENTS ON PROGRESS IN NONCHERNOZEM ZONE

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[Summary] Tomorrow is the 10th anniversary of the adoption by the CPSU Central Committee and the USSR Council of Ministers of a decision on measures to further develop agriculture in the nonchernozem zone of the RSFSR. At the microphone is our commentator Aleksandr Ruvinskiy:

"The main task set by the party and government in the decision was to use more fully the natural potential of an enormous zone whose borders stretch from the Baltic region to the Urals." In the present five-year plan and the last one, the agriculture of the nonchernozem zone received R53.5 billion in investments. Productive and power-generation capacities have noticeably risen. More than 2 million hectares of drained and irrigated land have been brought into use. Output of land- and animal-husbandry products has increased and become more stable. In the first 3 years of the present five-year plan, purchases of grain have gone up by 7 percent, including rye by almost 100 percent, and potatoes by 11 percent, over the previous five-year plan. In the last 2 years, all the autonomous republics and oblasts in the zone--29 in all--have been overfulfilling plans for the sale of grain to the state. Last year showed a profit of around R3 billion.

"Of course, great unutilized reserves remain in the zone. For instance, during the years of the present five-year plan the state has failed to receive a considerable quantity of potatoes, meat and milk. But even here, a marked breakthrough is occurring. Last year, stockfarmers of the nonchernozem zone overfulfilled plans for the purchase of all types of stockfarming produce. The yield of agricultural crops has risen. Not only individual farms, as was the case 10 years ago, but thousands of kolkhozes and sovkhoses are obtaining yields of 25-30 quintals of grain per hectare."

During the present five-year plan and the previous five-year plan, the state has spent R10 billion on the social transformation of the nonchernozem zone. An average of 61 apartments have been built on every kolkhoz and sovkhos--more than 10,000 farms in all. In Pskov Oblast at the moment, more housing is being built in the countryside than in towns and settlements.

"As a result of this, the population drain from nonchernozem villages has ceased. This is a very important factor. In Sverdlovsk Oblast in the past year, the number of people working on kolkhozes and sovkhoses has even noticeably increased."

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## REGIONAL DEVELOPMENT

### UKRAINE PRODUCING LESS HARD WHEAT

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[Aleksandr Ruvinskiy report]

[Summary] Farms are striving to complete the harvest of sunflower, soybeans and vegetables--the last crops to be harvested--in time for the holiday on 7 November. The cotton harvest is continuing in Central Asia. Winter sowing is continuing there and in Trans-Caucasia. The soil is being tended in fields from which the harvest has been cleared and which have not yet been affected by frost. This is the best time to do field work. Lime is being applied to the fields. Machine-operators are applying fertilizer, to fallow areas. The area of fallow in the country has been increasing in recent years as a result of recommendations from scientists. It has now reached 20 million hectares. The harvests of any crops sown on fallow are always stable, regardless of the weather. This is a most important factor in the struggle against drought. Agronomists are now visiting many regions to advise on scientifically based systems for work with the land. Most farms regard the recommendations of the scientists as binding. The introduction of scientifically based farming methods has enabled Stavropol Kray to obtain stable harvests in recent years. In the most arid zone of the kray procurement of the highest quality grain has increased 13-fold by comparison with the first half of the 1970s.

"But there are other examples. The Ukraine, which has always been described as the country's granary, has begun producing less hard wheat. In order to improve the quality of bread the republic now has to import this type of grain from other zones of the country. There the recommendations of scientists are not yet being used adequately.

All members of rayon agroindustrial associations have now been given great powers and independence which extend also to matters involving the most rational possible use of the land. Experience shows that the best way of ensuring that every field produces bigger and, stable harvests, year in and year out, is to introduce scientific systems of farming based on long-term planning."

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RSFSR FRUIT, VEGETABLE MINISTER INTERVIEWED ON SUPPLY PROSPECTS

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[Interview with V. I. Naumov, RSFSR minister of the fruit and vegetable industry, by A. I. Dushkin, editor-in-chief of the magazine: "The Course Toward Increasing Procurements of Vegetables"]

[Text] The editor-in-chief of the magazine, A. I. Dushkin, met with the RSFSR minister of the fruit and vegetable industry, V. I. Naumov, and asked him to answer a number of questions.

[Question] The party and government are showing a great deal of concern about improving the supply of fruit and vegetable products for the population. A good deal has already been done in this area. But even more will have to be done in order to carry out the tasks earmarked by the USSR Food Program for increasing the production and procurements of products that are rich in vitamins. Vladimir Ivanovich, what specific measures are being taken by the RSFSR Ministry of the Fruit and Vegetable Industry for a radical improvement in the supply of fruits and vegetables for the workers and for uniform and uninterrupted sale of these products?

[Answer] Yes, you are right. The party and government are indeed devoting special attention to providing for a continuous supply of fruit and vegetable products for the population, and they attach a great deal of significance to the effective work of the fruit and vegetable part of the agro-industrial complex. This is also demonstrated by the fact of the creation of the USSR Ministry of the Fruit and Vegetable Industry, similar ministries of the union republics and their local agencies. After the ministry was organized, the government adopted several decrees directed toward increasing the efficiency of the branch. And, finally, the Politbureau of the CPSU Central Committee has shown a great deal of concern for the state of affairs in the supply of vegetables to the population, having considered in October, 1983 the report of the USSR Minister of the Fruit and Vegetable Industry, Nikolay Timofeyevich Kozlov.

In order to satisfy more completely the needs of the population for fruits and vegetables, it is necessary first of all to produce more of them.

In 1982 in the republic as a whole 7.8 million tons of vegetable products were purchased, which is significantly more than the plan calls for and 1.4 million

tons more than were purchased in 1981. Such a quantity of vegetables had never been purchased in the republic before. In 1983 the rates of procurements exceeded the 1982 level, and as of 14 November 7,912,000 tons of vegetables had been purchased. This is almost 100,000 tons more than during all of last year. All this makes it possible to considerably reduce, and in our system completely eliminate, the arrears in the sale of vegetables to the state that have formed during the past 2 years of the current five-year plan.

But even the volumes of production and procurement of vegetables which we have achieved are inadequate for satisfying the growing demand of the population for these products, and also for the needs of the processing industry.

In keeping with the Food Program, a task has been set to increase the production of vegetables to 12.6 million tons under the 11th Five-Year Plan, and their procurements to 8.2 million tons. The interests of continuous satisfaction of the population and the needs of the canning industry set a task for the branch: to increase vegetable procurements to 9.5-10 million tons. By 1990 the gross production of vegetables should increase to 18-19 million tons.

In order to implement the projected program for the development of fruit and vegetable raising, we have developed and are carrying out a complex of measures. One of them, undoubtedly, is further work on specialization and concentration of the production of fruits and vegetables. Practice shows the indisputable advantages of raising these products on large specialized farms. As a rule, the productivity here is twice as great, and the level of profitability is 2.5 times higher than on unspecialized farms. I could give many examples in confirmation of this.

Thus the Bol'shevik, Zaokskiy and Dmitrovskiy sovkhoses in Moscow Oblast, the Verkhnemullinskiy in Perm Oblast, the Pobeda in Pskov Oblast and many other large specialized farms where vegetables are planted on 300-500 and more hectares in the structure of the planted area are regularly obtaining large yields with low production cost.

Work has been done and continues to be done in the republic for specialization and concentration of fruit and vegetable production. In our system alone there are 534 vegetable sovkhoses in operation at the present time. The highest level of specialization is in Moscow and Leningrad oblasts. In Leningrad Oblast, for example, 47 of the 192 sovkhoses specialize in the production of vegetables. One sovkhos has an average of 213 hectares planted in vegetables, and about 6,000 tons of products are produced from them. In Moscow Oblast, one specialized sovkhos has an average of 339 hectares planted in vegetables, where 8,600 tons are produced. It is no wonder that these oblasts are our leaders in providing the population with vegetables.

In the system of fruit and vegetable farming there are 665 sovkhoses that specialize in the production of fruits, and 250 of them are large agro-industrial enterprises that have considerable areas planted in fruits and berries, and they are equipped with fruit storehouses and shops for industrial processing of products. A considerable amount of work for specialization and



concentration of production has been done in Lipetsk, Rostov, Voronezh and Tula oblasts, in Krasnodar Kray and in certain other regions of the republic. About 60 percent of the area planted in fruits and vegetables is concentrated on specialized sovkhoses of Lipetsk Oblast, and they produce more than 73 percent of the fruits and berries. These farms completely fulfill the plan for procurements.

But on the whole the work for specialization and concentration of the production of fruit and berry products requires further development, especially along the line of concentrating planted fields and orchards.

We think that the main course in vegetable raising should be for each autonomous republic, kray and oblast to supply its own. And primarily such products as cabbage, carrots, table beets, greens and herbs and spices. These crops can be raised everywhere and there is no justification for shipping them from one oblast to another. Unfortunately we still have to deal with oblasts which even want to have cabbage, carrots and beets shipped in to them. As for heat-loving vegetables and onions, we shall increase the production of them in the regions of the republic that are most favorable for raising them and expand the zone of their cultivation correspondingly.

We will have to increase the productivity of fruit and vegetable crops considerably. A certain amount has already been done in this direction. While in 1981, when the ministry was being organized and the entire system was being created, they harvested 168 quintals of vegetables per hectare, in 1982 this figure increased to 195, and in 1983 it amounted to 203 quintals per hectare. But this is not the limit. In the next few years it is intended to increase the yield of vegetables to 200-250 quintals and more, and fruits and berries -- to 75-100 quintals per hectare.

The practice of many sovkhoses and entire oblasts shows that this is quite realistic. Each year large yields of vegetables are obtained by sovkhoses in Vologda, Pskov, Moscow and Kaluga oblasts, the Mary ASSR and other regions. More than 90 percent of the fruits and berries are harvested by farms of Voronezh and Kursk oblasts. The yields will be increased on the basis of further increasing the fertility of the soil, raising the level of the art of farming, and stepping up work for completely changing the production of fruit and vegetable crops over to irrigation and introducing comprehensive mechanization in their production.

In this connection I should like to discuss especially the introduction of industrial technologies on the basis of comprehensive mechanization. At the present time the production of fruit and berry products has a low level of mechanization, and many jobs in vegetable and fruit raising are done by hand, which makes it necessary to enlist residents of cities and workers' settlements. Therefore it will be necessary to do a large amount of work to change the branch over to industrial technologies.

This is far from a complete list of measures we are taking to improve the supply of fruit and vegetable products for the population.

As for uniform and uninterrupted supplies for sale, in addition to increasing the production and procurements, a large amount of work will have to be done here to preserve the products, to place them for long-term storage in the places where they are produced, and to introduce progressive methods of procurement and trade.

[Question] It is known that an important means of smoothing out the seasonality in the supply of vegetables to the population is protected ground, and in particular expansion of the network of hothouses. What has been done and what is to be done in the near future with respect to this?

[Answer] Hothouse vegetable raising has been extensively developed recently. During the years of the 10th Five-Year Plan alone about one billion rubles were invested in the development of this branch, and 684 hectares of winter hothouses and 360 hectares of plastic-covered area were constructed.

The areas of winter hothouses increased from 703 hectares in 1975 to 1,680 in 1982, or 2.4-fold, and plastic-covered areas -- from 1,632 to 2,083 hectares, respectively, or 1.3-fold. During this time the volumes of production of hothouse vegetables increased from 411,000 tons to 643,000 tons, or from 4.6 to 6.5 kilograms per city resident. A number of oblasts and krais of Russia are receiving considerably more of these vegetables. Thus in Stavropol Krai they are receiving 15 kilograms per resident, in Krasnodar Krai -- 12, in Tomsk Oblast -- 12.7, and in Leningrad Oblast -- 10.4 kilograms.

During the years of the 11th Five-Year Plan it is intended to invest about one billion rubles in the development of hothouse vegetable raising on farms of the RSFSR Ministry of the Fruit and Vegetable Industry system alone, and to construct 610 hectares of winter and 1,120 hectares of plastic-covered hothouses. The production of vegetables in covered ground structures in the Russian Federation will increase to 767,000 tons in 1985, which is 33 percent more than were obtained in 1980.

The republic's Food Program has earmarked increasing the supply of hothouse vegetables per city resident to 9.3 kilograms by the end of the 12th Five-Year Plan.

The production of hothouse vegetables will increase not only as a result of the construction of new structures, but also and mainly through their more effective utilization on the basis of increased productivity, the use of peat pots and peat blocks, and extensive introduction into production of the achievements of science and advanced practice and new methods of agrochemical service and fighting against pests and diseases of vegetable crops.

[Question] The buyers frequently complain about the poor assortment of vegetables that are for sale, and the quantity of greens for sale is especially small. This happens because many vegetable farms do not devote enough attention to the assortment of vegetables that are raised, and they try to fulfill the plan for procurements through one or two crops, for instance cabbage. What measures are being taken to improve the assortment?



[Answer] Regarding this question I must say that everything cannot be blamed on the raising of one or two crops because the majority of farms raise many crops, but at the same time one cannot but agree with you that, indeed, the assortment of products sent to trade is extremely limited and needs to be expanded considerably.

Organizations of the fruit and vegetable complex have begun to devote considerably more attention to green crops, herbs and spices and other vegetable crops. Work is being continued for further deepening of specialization of sovkhoses, divisions, brigades and teams in the production of these crops and the expansion of their assortment. At the present time the kolkhoses and sovkhoses are raising more than 30 kinds of green vegetables and herbs and spices. In 1982, for example, 603,000 tons of these vegetables were delivered to the tables of workers of the Russian Federation, which is 87,000 tons more than in 1981.

In 1983 as compared to the preceding year there was a considerable increase in the procurements of peppers, egg plants, horse radish, lettuce, sweet cabbage, celery and several other crops. The volumes of procurements of these vegetables early in the year increased as well. But the demand of the population for these valuable products is still not being satisfied. At the present time their per capita production in the republic amounts to little more than 5 kilograms, which is one-third the scientifically substantiated norms for consumption.

It should be recognized not all of the local workers are devoting the proper attention to cultivating green crops, herbs and spices, and other vegetables, and many of them are obtaining small yields. Their production requires a good deal of manual labor. There is a critical shortage of special packaging, and as a result of this shortage products frequently deteriorate in quality and lose their commercial appearance during transportation.

Unfortunately, in a number of cases it is thought that these vegetable crops can be grown only in limited areas, while in terms of their agrochemical properties, they can and should be raised in all climatic zones of the Russian Federation. At the present time the ministry has already earmarked measures for increasing the production of green crops and herbs and spices during 1984. A task has been set to increase their per capita production to the scientifically substantiated norms for consumption by 1990.

[Question] There is a paradox during the period of mass procurements: many sovkhos managers, especially in southern rayons, complain about difficulties in selling fruits and vegetables, and at the same time the consumers cannot find the products they need in the stores. What causes this and how does one overcome such an abnormal situation?

[Answer] Unfortunately there are cases like this, but there are fewer and fewer of them. The main reason for the appearance of this lack of correspondence, or paradox as you call it, is the failure to observe contractual commitments for the delivery of products, both on the part of procurement organizations and on the part of the sovkhoses. Certain trade and

processing enterprises are sometimes unprepared for mass receipt of products. In particular, the processing industry is not always provided with personnel in time, and the storehouses are not prepared either. In a number of cases the trade organizations, when they do not have enough stores or sales space, do not promptly prepare temporary trading points: booths, stands and so forth. These cases are also explained by a lack of discipline in certain trade organizations, which delays the receipt of products.

At the same time certain sovkhoses violate time periods for raising and delivering products, do not provide the proper assortment and range of quality, and deliver some products that do not meet the corresponding GOST's.

With the creation of the USSR Ministry of the Fruit and Vegetable Industry, the production, procurements, processing and trade of fruit and vegetables products are concentrated in one place, and we strive to balance the work of all these units, eliminating their points of separation. In a number of places we have already arranged smooth interconnections between the production and sales of products. For example, in Omsk, Saratov, Kuybyshev, Kemerovo, Rostov, Kazan, Tomsk and several other cities such paradoxes have become rare.

The ministry, in conjunction with local associations, is taking measures directed toward further improving the production, procurements and sales of products, and increasing state, planning and technological discipline. I think that in the near future these abnormal phenomena you have mentioned will be eliminated.

[Question] The path of the vegetables from the fields to the consumer involves large losses at the present time. As we know, there are many reasons for this. What is being done to reduce these losses to a minimum?

[Answer] Yes, in fact the path of the vegetables from the field to the consumer entails large losses, which depend on a number of factors. These include shortcomings in the provision of packaging, transportation, warehouse premises with chambers for preliminary cooling, sorting points, mechanization of loading and unloading, and the shortage of qualified personnel.

The ministry and the local agro-industrial associations are taking measures to reduce losses and improve product quality. But we still have a large amount of work to do here.

In vegetable raising a great deal of attention is devoted to the creation and selection of strains that are suitable for prolonged storage and shipment over long distances. For example, we have now created and are introducing the Zimovka strain of cabbage which keeps well, and in terms of the aforementioned qualities surpasses even such a very good strain as Amager-611.

More attention will be devoted to observing agrotechnical rules for the cultivation of vegetable crops. A correct combination of fertilizers has a great effect on the preservation of the products. Science and practice have shown that an excess of nitrogen fertilizers makes the products keep less well, and a normal combination of these with phosphorus fertilizers makes them

last longer. The preservability is undoubtedly influenced by the observance of norms and conditions for irrigation, the fight against pests and diseases, and the gathering of the harvest at the optimal time periods. Therefore we shall also devote more attention to all of these issues.

In order to prepare the vegetables to send them to the trade network, we envision the creation of specialized brigades and teams for prompt harvesting, commercial processing and packaging of the products. Measures are being developed to provide material incentives for high-quality delivery of potatoes, vegetables and fruits, and to establish material liability for delivering substandard, unsorted products. Much is being done to strengthen the material and technical base with the use of cold air and active ventilation, and also automatic regulation of temperature and moisture conditions.

We assign a large role in the reduction of losses to receiving the proper quantity and quality of products in the places where they are produced and to using the proper transportation to ship them to the consumer. Even in 1982 the volumes of receipt of products directly on the farms increased and amounted to 40-50 percent of the overall volumes of procurements, and in Volgograd, Omsk, Chelyabinsk and Sverdlovsk oblasts and Stavropol Kray, more than half of all the vegetables were procured by this method.

Receiving products in the places where they are produced is of great national economic significance, it raises a barrier against the appearance of poor-quality products in the cities, it contributes to preserving them, it creates favorable conditions for the utilization of warehouse capacities, and it saves money on transportation.

In order to improve the organization of the transportation of products, during 1982-1983 the ministry created 19 automotive transportation enterprises, and it is planned to create more of them in the future.

It is intended to increase the volumes of shipments of fruits and vegetables by automotive transportation, and responsibility is being established for the weight of the products that are received and sold. In 1983 the ministry used its own transportation to ship twice as much fruit and vegetable cargo as in 1981.

In 1983 as an experiment tomatoes were shipped on two refrigerated steamers that were specialized for vegetable shipments with a cargo capacity of 600 tons. They have many advantages over other kinds of ships. Since they have relatively small capacities, such steamers are quickly loaded from one or two farms, they are equipped with cranes for loading and unloading containers of vegetables, and they have cold air with regulators for temperature and moisture conditions. The tests showed that on these ships one can successfully ship tomatoes in any stage of ripeness -- pink and red -- and completely preserve their quality. Six of these vegetable ships should be in operation in 1984.

The use of containers and loading and unloading mechanisms is of decisive significance in preserving the products. Unfortunately, our demands are still being satisfied extremely inadequately. Here we need assistance from the RSFSR and USSR Gosplans and also the USSR Gossnab. Without them we will not be able to complete the introduction of shipments with containers and pallets. We also need help from the main administration for containers in providing the system with improved kinds of packaging materials.

We are expecting active assistance from the USSR Ministry of Railways in moving fruits and vegetable rapidly, as well as storing them. It is necessary to augment the fleet of refrigerated cars on the railroads, and when organizing shipments both in refrigerated and in ordinary cars, it is necessary to take into account the fact that the cargoes in them are perishable.

A similar wish can be expressed to the RSFSR Ministry of the River Fleet.

[Question] Very frequently, especially in the busy time of procuring fruits and vegetables, poor-quality products which are frequently unsuitable for sale to the population arrive in the cities and industrial centers of the country. What measures are being taken in the ministry in order to raise a solid barrier against such products and increase the responsibility of the suppliers for the quality of the potatoes, fruits and vegetables which they send to the consumer?

[Answer] This question is largely related to the preceding one which I just answered. Here one can only add that the ministry is taking measures to increase the responsibility of all units of the fruit and vegetable complex for the quality of the products that are delivered. In particular, in 1983 we placed stricter requirements on managers and specialists of associations and sovkhozes that have delivered poor-quality fruits and vegetables. The guilty parties have been punished administratively and materially.

In order to step up control over the quality of products that are delivered, the ministry will create a system of intradepartmental control, which should provide for the production and delivery of high-quality products.

[Question] A number of measures directed toward further development of the material and technical base and further strengthening of the economies of the associations, enterprises and organizations of the system of the USSR Ministry of the Fruit and Vegetable Industry serve as clear evidence of the concern of the party and government for increasing the production and procurements of fruit and vegetable products as well as their preservation. They envision the allotment of significant capital investments for the development of the fruit and vegetable complex, particularly for the construction of fruit and vegetable storehouses, and more than half of them are to be constructed in the places where the products are produced. How much of this work will be done by the RSFSR Ministry of the Fruit and Vegetable Industry, and how are these funds being assimilated?



[Answer] Under the 11th Five-Year Plan it was intended to construct fruit storehouses for 259,100 tons and vegetable and potato storehouses for 750,000 tons to be stored at one time. During 1981-1982 and the 9 months of 1983 we put into operation capacities for storing 303,000 tons of fruits and vegetables and assimilated more than 55 million rubles for these purposes.

For more effective utilization of capital investments intended for strengthening the base for storing fruit and vegetable products, the ministry has developed a system for the distribution of these facilities during 1983-1985 and is drawing up a program for their construction under the 12th Five-Year Plan. A number of storehouses that are already in operation are to be renovated with the introduction of active ventilation systems, mechanization of loading and unloading processes, and increased capacities.

In a number of oblasts industrial enterprises are acting as patrons and participating in the construction of storehouses. This has been organized very well in Saratov, Gorkiy, Rostov, Kurgan and several other cities. In Saratov Oblast, for example, industrial enterprises have helped to create highly mechanized storehouses to hold 120,000 tons and 26 large specialized stores. Considerable assistance in mechanizing and equipping storehouses has been rendered to city fruit and vegetable trade organizations by industrial enterprises in Kurgan. The practice of rendering assistance as patrons should become widespread in other oblasts, krays and ASSR's. This will be a large contribution to the implementation of the Food Program.

Many contracting construction organizations are slow in rearranging their work for rendering assistance to sovkhoses and trade and processing enterprises. As a result, a number of important storehouses and refrigeration facilities are very late in being put into operation and there are considerable amounts of incomplete work. They impede prompt and effective assimilation of capacities and delay the return on capital investments.

[Question] Our editorial office is receiving letters from people who suggest constructing as many storage facilities with refrigeration as possible in the southern regions of the country. Such storehouses will help to preserve all of the fruits and vegetables.

What is the scale of construction of storehouses with refrigeration equipment earmarked for the next few years in the southern regions, where large quantities of potatoes, vegetables and fruits spoil because of the hot climate?

[Answer] Such storehouses are to be constructed, in particular, in Krasnodar and Stavropol krays, Rostov Oblast, and the North Osetian, Chechen-Ingush and Kabardino-Balkar ASSR's, with an overall capacity of 74,000 tons.

[Question] Vladimir Ivanovich, permit me to ask another question pertaining to the strengthening of the material and technical base for storage. What does the ministry intend to do to develop the material and technical base for storage on its own sovkhoses so as to prolong the period of sales of fruits and vegetables?



[Answer] The system for the distribution of fruit and vegetable products approved by the ministry for 1982-1985 envisions constructing directly on the sovkhozes capacities for storing 403,000 tons of vegetables and potatoes at one time and 120,000 tons of fruits. Products will be kept in them for storage and uniform delivery to the trade network.

[Question] What is being done for further development of trade on the kolkhoz markets?

[Answer] Extensive utilization of trade on the kolkhoz markets will contribute to improving the supply of fruit and vegetable products to the population, and the farms are interested in this since the volumes of products sold at the markets are credited to their procurement plans. But to do this the farms must have trade personnel, and so far they have none. We have had to give people emergency courses in the skills needed in trade. Other organizational measures were also taken, as a result of which trade in the markets has expanded somewhat. Thus in 1983, as of 1 November they had sold almost 16,000 tons of vegetables as compared to 6,000 tons in 1982. Trade in vegetables was organized skillfully in the kolkhoz markets of Astrakhan, where 4,548 tons of vegetables were sold, Krasnodar -- 3,400, Rostov -- 1,722, Ryazan -- 797, Voronezh -- 821, Bryansk -- 761, and Tomsk -- 624 tons.

But on the whole I must say that we are still not fully taking advantage of trade in the markets. This is explained not only by the shortage of personnel, but also by the complications related to issues of establishing prices and control over their utilization, and accounting for the value of products that are sold. Additionally, the farms do not have cash registers or automated machines for keeping noncash accounts. This is something new for the sovkhozes, and it requires further development.

[Question] One of the "bottlenecks" on the path of movement of potato and vegetable products to the tables of the workers, as we know, are the fruit and vegetable offices. Because of the unsatisfactory work of many of them, many products spoil and an immense army of workers and employees of city enterprises and organizations are taken away, and, incidentally, they are not always utilized efficiently. What is being done to radically improve the work of the fruit and vegetable offices?

[Answer] The fact is that the material and technical base of the fruit and vegetable offices is very weak. The plans used for the construction of storehouses do not meet the requirements of the modern day and do not provide for the use of mechanization, so that the absolute majority of operations are performed by hand here. And, as we have already noted above, frequently large quantities of products come to the bases unsorted, which makes things even more difficult.

In order to improve the work of fruit and vegetable offices radically, it is necessary to strengthen their material and technical base considerably and to supply them with highly productive technical equipment. Concrete and more extensive help is needed here, primarily from the USSR Ministry of Machine Building for the Light and Food Industry and Household Appliances and also the

RSFSR Ministry of Trade, in order to provide the fruit and vegetable bases with highly productive machines and equipment.

[Question] At the meeting of the board of the USSR Ministry of the Fruit and Vegetable Industry of 12 October 1983, the minister, N. T. Kozlov, noted that the Ministry of the Fruit and Vegetable Industry of the Russian Federation has earmarked a program for improving procurement activity. Could you tell us something concrete about its essence?

[Answer] When the RSFSR Ministry of the Fruit and Vegetable Industry and its local agencies were formed they were not given a procurement staff, and it did not exist separately in the system of the USSR Ministry of Trade, the USSR Ministry of the Food Industry and the RSFSR Ministry of Agriculture. The work for arranging contracts and procurements of potatoes, vegetables and fruits has been carried out by trade enterprises, dining room trusts and canning plants along with the main tasks for which they are responsible. The delivery of fruits and vegetables to the unionwide and republic supplies has been handled by specialized vegetable and fruit sovkhozes of the USSR Ministry of Agriculture.

The RSFSR Ministry of the Fruit and Vegetable Industry and local agencies in 1982-1983 conducted centralized work for the development and improvement of procurement and sales activity in our country.

The main directions of this activity can be reduced to the following: city fruit and vegetable trade organizations are assigned the functions of a unified contracting agent -- the organizations that purchase fruit and vegetable products for all trade enterprises of the city. As early as 1983, 61 of the 90 fruit and vegetable trade organizations had contracted for all of the fruits, vegetables and potatoes in the cities where they operate. Trade organizations of these cities receive products from the farms under orders from the city fruit and vegetable trade organizations or their warehouses. Solving the problem of a single contracting agent increases the responsibility of Plodoovoshchkhov associations for the supply of the necessary fruit and vegetable products to the city.

The volumes of procurements will also increase as a result of the creation and inclusion of new city fruit and vegetable trade organizations.

In order to further improve and increase the volumes of deliveries of fruit and vegetable products to the unionwide and republic supplies, the ministry has begun to create a special procurement and sales system. In 1983 offices for procurements and deliveries of fruit and vegetable products to the unionwide and republic supplies and consumers of the oblasts, krays and republics were organized in Krasnodar and Krasnoyarsk krays and Rostov, Volgograd, Kuybyshev, Saratov and Kostroma oblasts. These offices have been assigned the functions (based on local conditions) for coordinating the importing of fruits and vegetables from other union republics.

In 1983 the proportion of vegetables procured by the system of the fruit and vegetable industry amounted to 58 percent, and the proportion of fruits

amounted to 71 percent of all the procurements of these products in the RSFSR (in the public sector). The proportion of deliveries of fruits from the system of the RSFSR Ministry of the Fruit and Vegetable Industry into the unionwide and republic supplies amounts to 90 percent of the vegetables and 34 percent of the fruits.

The work for further improvement of the procurement and sales activity will be continued. In particular, 18 oblast (kray) ispolkoms and councils of ministers of ASSR's are supporting the ministry's proposal, and in 1984 they will transfer the functions of a unified contracting agent to the city fruit and vegetable trade organizations. In 10 oblasts, krays and ASSR's it is intended to create offices for procurements and deliveries as parts of the Plodoovoshchkhov associations

As before, the Russian consumers' union is still the main procurement and supply organization for potatoes.

At the present time the ministry in conjunction with agro-industrial associations is taking measures for eliminating shortcomings in the work of the system which were noted in the decree of the Politbureau of the CPSU Central Committee concerning the report of the USSR minister of the fruit and vegetable industry, N. T.Kozlov, and is directing all efforts toward successful implementation of measures for fulfilling the assignments of 1984.

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## AGRO-ECONOMICS AND ORGANIZATION

### PROGRESS OF AGRICULTURE IN 1983 ASSESSED; PROSPECTS OUTLINED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 1, Jan 84 pp 3-6

/Article: "Along the Path To Improvements"/

/Text/ The workers attached to the agroindustrial complex are playing an important and responsible role in carrying out our party's chief task -- achieving steady improvements in the welfare of our Soviet people. The decisions handed down during the May (1982) Plenum of the CPSU Central Committee demonstrated a new concern on the part of the party for agricultural development. A desire to mobilize the efforts of all branches of the APK /agroindustrial complex/ for the purpose of achieving higher final results was concentrated in these decisions. The implementation of the plenum's decisions is making it possible to create the conditions required for profitable kolkhoz and sovkhoz operations, to raise the effectiveness of cost accounting procedures, to supply farms with leading personnel and specialists and to raise their wages. Agroindustrial associations were created in all rayons, oblasts, krays and autonomous republics and their councils approved. The first year of operations for these organs of administration revealed that under modern conditions they provide a very flexible and vital form of control, one which promotes greater activity by the broad masses of workers and more responsibility by leaders and specialists for solving economic problems and regulating the organization of labor.

The workers in all branches of the APK focused their attention on those problems concerned with improving the final operational indicators. A great role was played in this regard by the introduction of collective contracts on an extensive scale. During 1983, more than 150,000 economic subunits in agriculture throughout the country operated on the basis of collective contracts.

The measures carried out had a positive effect on the operational results of branches of the agroindustrial complex. Improvements were achieved during 1983 in the production indicators of APK enterprises and many shortcomings associated with supplying the population with food products were eliminated. During the third year of the five-year plan the kolkhozes and sovkhozes increased their production of grain, sugar beets, potatoes and all animal husbandry products. According to preliminary data, the gross output for agriculture in 1983 increased by 4.6 billion rubles compared to 1982 and it surpassed the indicators for previous years.

The grain growers in a majority of oblasts in the RSFSR, Kazakhstan, Belorussia, Uzbekistan and the Baltic republics made a worthy contribution towards implementing the Food Program. Considerable quantities of grain were delivered to the granaries of the homeland by farms in Saratov, Kuybyshev, Voronezh, Orenburg, Penza, Tambov and Ulyanovsk oblasts and also by farms in the Tatar and Bashkir ASSR's. The socialist obligations for grain sales to the state were successfully fulfilled by farms in Kiev, Sumy, Poltava and some other oblasts in the Ukraine and by farms in Kustanay and Uralsk oblasts in Kazakhstan and in Tula, Gorkiy, Moscow, Orel, Perm, Sverdlovsk and all other oblasts in the nonchernozem zone. Compared to the previous year, the gross yields of sugar beets, potatoes and other farming products increased considerably in this zone during 1983.

For the country as a whole, the plans for procuring potatoes, vegetables, tea leaves, flax fiber and tobacco were fulfilled. The procurement points were supplied with 19.5 million tons of vegetable products and 592,000 tons of tea leaves. The purchases of flax fiber amounted to 457,000 tons -- this was the best indicator for the past several years. The flax fields on farms in Smolensk and Kalinin oblasts and in the Mari ASSR produced high yields. The tobacco growers of Moldavia and Kirghizia also pleased the country by providing record yields.

Over the past 2 years, tobacco production in the Kirghiz SSR has increased by almost twofold. The farms in Osh Oblast are cultivating this labor-intensive crop. Purposeful work performed by the oblast's workers, based upon the extensive introduction into operations of brigade and family contracts, cost accounting procedures and scientifically sound crop rotation plans, has made it possible to increase considerably the output yield per hectare and to strengthen the kolkhoz and sovkhos economies.

Our country's cotton growers had to operate under extremely difficult weather conditions during 1983. The ripening periods for the cotton were dragged out and this delayed considerably the harvest period for this crop. However, just as in previous years, persistent labor on the part of the cotton growers produced fine results. The cotton growers of Azerbaijan successfully fulfilled their socialist obligations and the cotton growers of the Turkmen SSR fulfilled their plans for purchasing the white gold. The farms of Uzbekistan delivered the largest quantities of raw cotton to the procurement points. The yields of the more valuable fine-fiber cotton increased in all areas.

Compared to previous years, considerably more coarse and succulent feed was procured at kolkhozes and sovkhoses throughout the country during 1983. The plans for procuring hay, haylage and silage were fulfilled successfully.

The livestock breeders achieved high results in 1983. For the country as a whole, the plans for purchasing the principal types of animal husbandry products were fulfilled. The quantities of milk, meat, eggs and wool delivered to the procurement points were considerably above the 1982 levels.

It bears mentioning that the increase in animal husbandry products was achieved mainly as a result of improved animal productivity. In 1983 the average yield per cow increased by eight percent, egg production per laying hen increased by



two percent and increases took place in the average daily weight increases in the live weight of the cattle, in the weight conditions for animals sold and in the clipping of wool. The highest indicators for growth in the productivity of livestock and poultry were achieved by the livestock breeders in Estonia, Latvia, Lithuania and a number of oblasts in the Russian Federation, Belorussia and other regions of our country. The successful work by the livestock breeders was largely the result of a higher feeding level for the animals and the carrying out of purposeful organizational and mass-political work in the rural areas. The number of animal offspring increased during 1983, a reduction took place in the losses of all types of livestock and poultry and the overall number of livestock increased. Positive changes took place in the structure of feed production, increases were noted in the proportions of hay and root crops and this was reflected in raised productivity. The operational experience of the livestock breeders convincingly underscores the great opportunities that are available for rapidly increasing the production of animal husbandry products and also the availability of unused reserves in an important branch of agriculture.

During 1983 the quality of the agricultural products being produced was raised. For example, the sugar content of sugar beets accepted for processing was considerably higher than in 1982 and improvements were noted in the quality of the grapes, vegetables, raw cotton and feed.

The logistical base for the rural areas was strengthened noticeably. Agriculture utilized more than 38.5 billion rubles worth of capital investments and it was supplied with approximately 368,000 tractors, more than 285,000 trucks, almost 119,000 grain harvesting combines and 22.7 million tons of mineral fertilizers. In solving the tasks embodied in the USSR Food Program, all of the industrial ministries and departments devoted greater attention to ensuring that agriculture was supplied with the required logistical resources and that the orders of the rural areas are carried out in a more efficient manner.

Simultaneous with the growth in agricultural output, increases took place in the production of goods in almost all branches of the APK. Compared to 1982, sugar production in 1983 increased by more than 1 million tons, vegetable oil -- by 230,000 tons and canned fruit and vegetable products -- by 10 percent. Noticeable improvements took place in the indicators for enterprises of the meat industry. For example, meat production increased by 650,000 tons, animal oil -- by 150,000 tons and whole milk products -- by more than 1 million tons.

Workers in the fishing industry achieved great successes during 1983. The production of canned fish goods, fish products and feed meal surpassed the planned tasks. Improvements took place in the assortment of fish products.

The enterprises of Glavmikrobioprom increased their production above the figures for 1982.

The operational successes achieved by APK workers in 1983 testify to the great opportunities which are available for further increasing production. However, even during 1983 not all of the enterprises fulfilled their assigned tasks. Just as in previous years, product losses occurred during

crop harvesting operations and also during the processing of raw materials at the industrial enterprises. The procurement organizations did not ensure the timely acceptance of the fruit and vegetable products and the proportion of products accepted in the production areas was negligible.

During 1984, in conformity with the USSR Food Program and the planned tasks, the APK workers must solve more complicated tasks and achieve better interaction among all branches of the APK. Gross agricultural output in 1984 (in comparable 1973 prices) must reach 140.4 billion rubles, or 10 percent more than the amount produced in 1982. High rates of growth in gross agricultural output are required for all of the union republics.

Just as in past years, the agricultural workers must focus a maximum amount of attention on the production of grain and feed. In conformity with the five-year plan, the gross yield of grain in 1984 must reach 240 million tons. The plans call for grain crops to be grown on not less than 123 million hectares and for the cropping power to be no lower than 19 quintals per hectare. The plans call for a higher cropping power for grain crops on farms in the Ukrainian SSR (30.7 quintals per hectare), Moldavian SSR (38.5 quintals per hectare) and the Estonian SSR (29.7 quintals per hectare).

In 1984 the areas to be used for corn, pulse crops, rape and soybeans will be expanded. The plans call for a further increase in feed procurements, especially hay, root crops and also for improvements in their quality.

In solving the assigned tasks concerned with raising the production of farming products, a maximum amount of attention must be given to raising the cropping power of all agricultural crops. The sunflower yields must be raised to 15.6 quintals per hectare, sugar beets -- to 269, raw cotton -- to 29.5, vegetables -- to 177, grapes -- to 72 and fruit and berries -- to 46 quintals per hectare. Further increases in the use of mineral and organic fertilizers, improvements in the culture of farming, the introduction of scientifically sound crop rotation plans and a reduction in losses in products grown will all play a large role in achieving these indicators. For 1984, the plans call for up to 23.3 million tons of mineral fertilizers to be made available to agriculture, in a conversion for a 100 percent nutrient content. Compared to 1982, organic fertilizer applications must be increased by five percent (up to 966 million tons). The areas of reclaimed lands will be expanded in 1984, with the plans calling for 666,000 hectares of irrigated and 700,000 hectares of drained land to be placed in operation.

High goals are planned for the development of animal husbandry operations. According to computations by USSR Gosplan, during 1984 the production of meat in dressed weight must reach 16,800 tons, milk -- 97.1 million tons, eggs -- 74.7 billion and wool -- 467,000 tons in physical bulk. In order to achieve these indicators, it will be necessary first of all to raise the productivity of the animals. Thus the milk yield per cow in the public economy must be raised to not less than 2,400 kilograms and the weight conditions for cattle sold must be increased by 10-15 kilograms.

In 1984, work aimed at further strengthening the logistical base for agriculture will be continued. The plans call for agriculture to be supplied with more than 380,000 tractors and 116,400 grain harvesting combines and

agricultural machines for field crop husbandry for a total value of 3.8 billion rubles and for animal husbandry and feed production -- 2.8 billion rubles. The power engineering capabilities of agriculture, according to estimates, will reach 734 million horsepower. Capital investments for the entire complex of operations will reach no less than 38 billion rubles and for construction and installation work -- 21.8 billion rubles.

Just as in previous years, special attention is being given to developing the nonchernozem zone of the RSFSR. The plans call for capital investments in agriculture in this zone to reach 8.4 billion rubles, including approximately 4.8 billion rubles for construction and installation work.

The capital investments allocated for agriculture must be concentrated mainly on underway construction projects and installations.

Considerable volumes of capital investments are being used for non-production construction. The proportion of non-production construction, compared to the overall volume of state capital investments for the entire complex of operations, will amount to 21.6 percent (8.5 billion rubles) in 1984 and at kolkhozes -- 23.9 percent, or 3.2 and 4.6 points higher respectively than the figures for 1982. In 1984 the plans call for 27.5 million square meters of housing space to be placed in operation, or 4 million square meters more than in 1982.

In 1984 the agricultural workers must devote greater attention to the efficient utilization of the production potential created and the resources allocated. The entire increase in gross agricultural output must be achieved by raising labor productivity, which in public agriculture must be increased by 19.6 percent compared to the 1981-1982 period. The wage level in agriculture, according to estimates, will increase in 1984 to 154 rubles (it was 143 rubles in 1982). The task has been assigned of lowering the production costs for agricultural products by making more efficient use of fixed capital and labor and material resources.

Considerable work must be performed during 1984 in connection with achieving a proper balance among all branches of the APK. In this regard, special attention is being given to the placing in operation of installations for the storage and processing of agricultural products and to supplying them with modern equipment. Work directed towards improving economic relationships among the APK branches and raising their responsibility for the final results and for implementing the USSR Food Program will be continued.

During the December (1983) Plenum of the CPSU Central Committee and the 10th Session of the USSR Supreme Soviet, 10th Convocation, an evaluation was provided of the work performed by workers attached to the agroindustrial complex. At the same time, attention was directed to the serious shortcomings noted in carrying out the Food Program. During 1984, the chief task confronting workers assigned to all branches of the APK is that of achieving further growth in production and improving the quality of the products.

"Commencing with the very first days of the new year" stated Comrade Yu.V. Andropov, "special importance is attached to making a fine start and to

preparing ourselves for coping with raised workloads and with the many difficulties which lie ahead."

It will be necessary first of all to concentrate attention on the more urgent problems, the so-called bottlenecks, the solving of which is required if success is to be realized.

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APK COMMISSION REVIEWS PROBLEMS IN IMPLEMENTING FOOD PROGRAM

Moscow SEL'SKAYA ZHIZN' in Russian 24 Feb 84 p 2

[Unsigned article: "Greater Responsibility for Plan Fulfillment"]

[Text] A regular meeting of the Agro-Industrial Complex Commission of the Presidium of the USSR Council of Ministers examined a series of issues dealing with fulfillment of the USSR Food Program.

Yu.M. Khusayinov, Deputy Chairman of the BSSR Council of Ministers, and A.G. Ovtov, deputy chairman of the Penza oblispolkom, reported on the winter livestock situation and on fulfillment of output quotas in that sector.

They pointed out that there were slight production increases in livestock and poultry during the winter on kolkhozes and sovkhozes in the BSSR and in Penza Oblast, as well as increased sales to the government of milk and meat as compared with the same period in 1982-83. The Commission also pointed to insufficient efforts to employ existing reserves and capabilities to increase the production of animal products. Several agro-industrial associations have failed to make adequate attempts to ensure a reliable feed base and to use feed supplies on the farm in an efficient manner.

More than half of the livestock farms in Penza Oblast do not have feed processing facilities. A great part of the feed ration consists of concentrates, and there is inadequate preparation and use of hay, silage, straw and root plants. Newer ways of labor organization in the livestock sector are slow to be introduced, in particular the continuous line system of output production.

There is not enough work done in the BSSR to improve agricultural practices on the poorer kolkhozes and sovkhozes, to increase meat production in general and on the subsidiary farms of enterprises. Organizations from Sel'-khoztekhnika provide poor technical service to farms, complexes and poultry farms.

The Commission demanded that directors and specialists of agro-industrial associations in the BSSR and in Penza Oblast immediately eliminate shortcomings in the winter livestock situation and undertake measures to meet and surpass 1984 state plans for production of animal products.



Also discussed was fulfillment of decisions reached by the government of the USSR for the production and supply of lime compounds to agriculture. The following ministries were cited for failing to implement decisions of the May 1982 Plenum of the CPSU Central Committee for better soil fertility by greater use of chemicals on the land: the USSR Ministry of Agriculture, Ministry of the Construction Materials Industry, Ministry of Construction, Ministry of Industrial Construction, Ministry of Rural Construction and Ministry of Transport Construction.

Inasmuch as measures for soil deoxidation in agriculture are extremely important, the above ministries and administrations are to undertake specific measures guaranteeing a supply of lime compounds to agriculture, 63 million tons in 1985 and 80 million tons in 1990, amounts already called for in the USSR Food Program. By 1984 these ministries must bring the maximum possible number of chemical plants into operation, those on which construction had already begun, and ensure an efficient use of capital investments and contract work for these plants. The Ministry of Railways is instructed to have a steady supply of hopper cars for on time shipments of lime compounds to the agricultural sector.

As part of the control process, reports were heard from the USSR Ministry of the Petroleum Industry, Ministry of Industrial Construction and Ministry of Construction about work on plants for liquid paraffins, which are necessary in the cultivation of protein and other feed additives. Much attention was given to bringing units for the production of liquid paraffins into immediate operation at the Kremenchugskiy, Novoufimskiy, Novogorkovskiy and Syzranskiy refineries.

A decision was reached by the Commission for conducting drainage and other work in swamplands for the supply of peat.

Production and output use on reindeer herding and hunting enterprises in regions of the Far North were also considered. The RSFSR Council of Ministers, other responsible ministries and administrations are instructed to undertake additional measures for a balanced growth of agriculture, processing enterprises and other sectors of the agro-industrial complex in the northern regions of the RSFSR.

The Commission severely censured violations of profit use by state agricultural enterprises in Vitebsk Oblast.

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## AGRICULTURAL MACHINERY AND EQUIPMENT

### INDUSTRIAL SERVICES TRY TO KEEP PACE WITH SPRING SOWING

LD151917 Moscow Domestic Service in Russian 1600 GMT 15 Mar 84

[Report on sowing campaign by commentator Semen Astakhov]

[Text] Spring this year is not proceeding from the south as normal, but, from all signs, from the west, or, more accurately, from the southwest. The mass top-dressing of the fields from the air has been started, for example, in Belorussia. Here is another report from Lithuania: There, too, the top-dressing of winter crops and meadows has begun.

These reports are forcing agriculture's partners within the agroindustrial complex to make haste too. The Krasnaya Zvezda works, which supplies seed-drills, has coped with its pledges. Its machines have been dispatched in excess of plan to the Kuban, Stavropol Kray and Uzbekistan. The Tselinogradselmash and Belinskseilmash associations are working ahead of schedule with their plan to produce sowing equipment. However, as was stated in one of our earlier reports, the equipment is not always reaching the kolkhozes and sovkhoses in good time. A particularly difficult situation came about at the Volgograd tractor works, Minsk tractor works and Belinskseilmash and Ryasanseilmash works, but we were informed today that measures have been taken by the [word indistinct] workers and that the situation improved in March as regards the tractor and agricultural equipment construction industry as a whole. The supply of rail wagons is now close to the planned level. The Volgograd people especially have got things moving. The number of tractors there awaiting dispatch has been halved, and there are at present about 1,000 such tractors at the Volgograd works. Wagons are now being supplied in excess of plan to the Minsk tractor works. Seed-drills from the town of Kamenka in Penza Oblast have been getting to the fields faster. However, it is important also for the machines not to stand idle in the fields and that they be used correctly and as efficiently as possible. This was discussed today at the collegium of the USSR State Committee for the Supply of Production Equipment for Agriculture. In particular it considered the question of how Uzbekistan's agricultural machine operators are being assisted by the republic's engineering services. An analysis has shown that in the main this is being done well, but work at technical service stations is not always organized smoothly. As a result, repairs are not being carried out in good time and are sometimes of low quality. The collegium paid particular attention to the maintenance of

kolkhozes and sovkhoses oil stores. This is important because the achievement of economies in fuels and lubricants is dependent upon this. The collegium adopted measures for the speediest possible elimination of the shortcomings.

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## TILLING AND CROPPING TECHNOLOGY

### PROBLEMS, TASKS IN HARVEST PROGRAMMING DISCUSSED

Moscow IZVESTIYA in Russian 26 Jan 84 p 3

/Interview with I. S. Shatilov, first vice-president, academician of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin, by A. Ivashchenko, IZVESTIYA observer: "Harvest According to a Program"; date and space not specified/

/Text Man cannot shield the field from a burning sukhovey, when the almost formed ear fades and leaves fold. He will not shelter it from untimely showers, which lay heavy swaths on the ground. The field cannot be heated like a cottage in cold weather and ventilated during intense heat.

However, year after year man needs more and more of what grows on land, first of all, grain, because it is the beginning of all beginnings. That is why man creates varieties capable of withstanding adversities, improves methods of soil cultivation and fertilizes and irrigates it. To the extent that farming exists in the world, so the peasant dreams of gathering harvests "according to his desire," or, as is commonly said in today's language, of obtaining programmed harvests.

/Question Ivan Semenovich, what is harvest programming? What immediate and remote prospects open up here? In what state is the problem now?

/Answer This question is not simple and, very likely, not everyone is interested in it. It is still discussed primarily in circles of specialists. But we will try together to analyze it.

We will begin from the fact that on the earth the yield ranges from 2 to 500 quintals of dry biological mass per hectare. We have available quite reliable methods enabling us to determine the possibilities in the formation of the yield of the biological mass. Precisely the biomass! Because man has become accustomed to consider what he takes for himself--grain, tubers and fiber--the harvest. However, in addition to this, the plant has roots, a stem and leaves.

Unfortunately, the wide reader hardly knows this, but no less than nine-tenths of the "building material" in the harvest is provided by solar energy and carbonic acid occurring in the atmosphere. In essence, all our agrotechnical methods are aimed at helping the plant to better utilize the sun and... to add one-tenth of the lacking material. At first glance this is a very simplified task.

Specialists have performed a vast volume of work on the determination of integral radiation and in a number of cases of photosynthetic active radiation coming from the sun to the soil surface. This term is still little known to the wide reader. Not so long ago, however, the word "ecology" was also current only in special literature. The same is with photosynthetic active radiation. It will be remembered gradually, especially as every rayon in the Soviet Union now has data on it. For the sake of clarity I will cite two examples. In the localities near Moscow the radiation intake from the end of April until October totals about 3 billion kilocalories per hectare. With an accumulation of 2 percent of the sun energy the harvest should contain 60 million kilocalories, which corresponds to the production of approximately 150 quintals of absolutely dry mass per hectare.

/Question/ Excuse me, for what part will grain proper account?

/Answer/ For 50 quintals. In Central Asia the amount of photosynthetic active radiation reaches 8 billion kilocalories. With an accumulation of even 1 percent of such a powerful solar flow 80 million kilocalories, that is, 200 quintals of the mass, should be "fused" into the harvest.

/Question/ This is a calculation, but what about practice and experimental data?

/Answer/ Today the world produces 1.5 billion tons of grain. It is easy to calculate that  $\frac{1}{2}$  percent of photosynthetic active radiation is accumulated. Raising this amount to 2, or perhaps, 3 percent would mean having 5 to 6 billion tons of grain. It is difficult to think of a more exciting task.

With respect to experiments Prof G. P. Ustenko, a scientist from Volgograd, experimented under irrigation conditions for a number of years. The following harvests were obtained: 73 quintals of winter wheat with a projected level of 75 quintals; 1,570 quintals of corn for silage, while 1,500 quintals were programmed. Under production conditions it was planned to harvest 60 quintals of winter wheat, but almost 4 quintals more were obtained.

/Question/ Does such an accuracy exist everywhere?

/Answer/ Yes, as a rule, harvests are close to the estimated ones. They become an integral quantity. I mentioned above that we should add 10 percent of lacking elements to the plant in the field. But herein lies the difference. In order to cope with the task, when programming the yield, it is necessary to take into consideration and to correctly apply farming and plant growing laws. Which ones? I shall mention them.



The law of equivalence and irreplaceability of the factors in the life of plants, whose essence lies in the fact that the conditions necessary for the plant (heat, water, light, food and others) cannot be replaced with others;

the law of the limiting factor consisting in the fact that the yield level is determined by the factor occurring in the minimum;

the law of the optimum, whose essence lies in the fact that only an optimal correlation between moisture and nutrients ensures the best development of plants;

the law of return, whose essence lies in the fact that for the harvest formation plants consume nutrients, which must then be returned to soil.

/Question/ Ivan Semenovich, I am always surprised by how efficiently plants react to a change in the length of the day and in the drop in day and night temperatures and, depending on this, accelerate or slow down their development. An impression is created that plants are "cleverer" than we are. It is astonishing--they continuously receive information from the external world and process it...

/Answer/ Well, we "learn" from plants. We must be able to ask what they need for a full bloom. For example, let us take fertilizers. This is a very powerful factor in the increase in the yield. There are dozens of methods of determining optimal doses for various crops. The field method of determining the effectiveness of various doses and correlations of fertilizers has become the most widespread. The effectiveness of fertilizers in the country's various zones has been determined by means of this method.

/Question/ This means that, when programming the yield, we must not overlook any of the factors you mentioned. However, they are violated very often, if we talk about extensive practice. Here it is appropriate to mention V. I. Lenin's words: Remember: "If an iron chain is needed to hold a load, for example, of 100 poods, what will we get from the replacement of one link of this chain with a wooden link? The chain will break. The strength or wholeness of all the remaining links of the chain, except one, will not save the situation. If the wooden link breaks, the entire chain will burst."\*

The same is here. Let us assume that you prepared an efficient program and I came on a powerful wheel tractor to cultivate a plot for sowing and simply rammed it. But the optimum soil density for most crops ranges from 1.1 to 1.3 grams in one cubic centimeter. After my cultivation the root system will not receive a well-aerated layer.

/Answer/ That is why I would not let you on my plot.

/Question/ But others do. Moreover, as a result of unsound management soil fertility diminishes catastrophically. You yourself once cited as an example the work done at the Scientific Research Institute of Agriculture imeni V. V. Dokuchayev on a comparison of the content of humus in soil determined 100 years ago in 1883 by Dokuchayev. It follows from the materials that soil

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\*V. I. Lenin, "Poln. sobr. Soch." /Complete Works/, Vol 32, p 201.

containing 10 to 13 percent of humus has not remained in the central chernozem zone by now. In most regions of the zone the content of humus in the formerly famous chernozem has declined by 3 percent. On the other hand, soil containing 2 to 4 and 0.5 to 5 percent of humus, which 100 years ago occurred only in individual spots, has increased sharply.

This means that the effectiveness of fertilizers is negligible here. Producing them, plants often operate to no purpose. The productivity of arable land is low. With regard to quality, especially that of wheat, it is a cause for alarm. Flour from improver wheats has to be brought even to the Ukraine. Local grain is used for mixed feed. How to coordinate all this with the subject of our discussion?

/Answer/ This question is correct. But not only science is guilty of this. There are many aspects here. The production of harvests calculated in advance and the all-around consideration of factors determining both the level of the yield and the increase in soil fertility exclude any voluntarism whatsoever in agronomy and make it possible to approach the improvement in farming from scientific positions. Mathematical modeling will replace voluntarism, the quest for instantaneous success and thoughtlessness.

Our farming will change over to extensive harvest programming not tomorrow or the day after tomorrow, but the first experimental oblast, kray and republic services for harvest programming outfitted with high-speed computer equipment are needed right now. You have noted correctly how plants react efficiently to fluctuations in the environment. We must respond just as efficiently. From every field where special equipment is installed information should instantaneously enter the main computer center of the agrarian-industrial association, be processed here and, according to the principle of cybernetic feedback, give recommendations to farms.

Then no one will take the risk of whistling an order from rayon instances to sow, fertilize or mow grain. Last year we obtained programmed harvests on an area of 1 million hectares. This work was expanded in Stavropol Kray, Rostov Oblast, Tataria, Bashkiria, near Sverdlovsk and Leningrad, in the Ukraine, Uzbekistan, Georgia, Tajikistan and Kirghizia.

/Question/ The literature on calculated harvests only slightly discusses sowing dates and seeding rates. From the experiments which I organized and conducted myself for many years it can be concluded that this is a problem of vast importance. That is why. Science named five basic factors--conditions for the life and development of plants--nutrients, moisture, light, heat and air. I dare to assume that the list is incomplete. It lacks the sixth factor, which is called unified time and space.

I was often told that this did not make any sense and that thousands and thousands of experiments on seeding rates and sowing dates were performed. Yes, there was and there is no shortage of such experiments. But all of them are absurd methodologically. Why? This is why. For example, winter wheat is sown in terms of 5 million germinated seeds per hectare on 5 or even 10

dates. What answer will such an experiment give? An unequivocal one. At a seeding rate of 5 million the biggest harvest is attained when the experiment is performed on such and such a date.

Next. How are seeding rates studied? Let us assume that on 1 September the same winter wheat is sown in terms of 1, 2, 3, 4, 5 and 6 million seeds per hectare. What question will this series answer? When wheat is sown on 1 September, such and such an amount--and it alone--of seeds placed in soil ensures the biggest effect.

But different seeding rates must be studied against the background of different sowing dates in order to receive an answer to the following question: On what date and at what rate is the highest effect attained? Then it will become clear what unified time and space is.

Owing to an early sowing date, in farm tests Kolos and Niva combines threshed 80 quintals per hectare--twice as much as compared with the accepted lowered seeding rate. This fact was recorded in many volumes of the report on the advantages of these combines. On an early sowing date under irrigation conditions they attained a yield of 111.1 quintals, while the seeding rate was less than 1.5 million per hectare.

/Answer/ You found a vulnerable spot. 'There is something to think about here. Indeed, why should we throw out 3 quintals of seeds of winter wheat per hectare, which nature itself has endowed with the ability to grow in shrubs, while on the virgin land of the east spring wheat--it has no time to become shrubby--is sown at a rate one-half and even one-third of the above.

/Question/ A great deal is now written about zonal farming systems and about the increasing gap between the results obtained during the testing of varieties and in extensive production practice. I remember how long bezostaya-1 and mironovskaya-808 were tested. Then strain testing plots were not overloaded with new varieties. But that is why the best variety stands so firmly on fields to this day.

A true explosion has occurred in selection. Not so long ago long wheat stems became short and everything went for the ear and grain. A stunning responsiveness to fertilizers and an increased moisture supply appeared. According to the program it is the foundation for grain! But all this came abruptly to an end. For some reason a flow of raw varieties has now poured into state tests. Then they are removed from regionalization after 2 or 3 years and state tests are again overloaded with new ones. Therefore, I postponed the test problem to the concluding part of our discussion.

Here is a fact concerning two strain testing plots. This year 50 lucerne varieties are to be sown for fodder productivity and 50 varieties, for seed productivity. This represents 400 plots! A total of 200 of them will have to be harvested four times. This results in 800 plots. Moreover, seed productivity must be determined three times, that is, the first harvest for green mass, the second, for seeds and the third also for green mass... Thus, in a season it is necessary to harvest 1,400 plots and not simply to harvest, but to weigh,

to take analyses for moisture and to determine leaf formation. And all of this for one crop alone. But the same specialists must sow and harvest cotton, tobacco, corn for grain and green mass, Sudan grass (three to four harvests), sorghum and spring barley. Is it possible to cope with such a volume of work and to give an accurate evaluation to every variety?

/Answer/ Of course, not.

/Question/ The idea of such a hasty testing of varieties and of a rapid regionalization belongs to M. Fadeyev, the present manager of the state strain testing network. In the chase after innovations he intends to establish large testing stations. They were permitted, but "within the limits of existing allocations." This means that for the organization of one station it is necessary to close six or seven strain testing plots. But Nikolay Ivanovich Vavilov established a ramified network of state strain testing plots for the purpose of bringing them maximally closer to production. Are corrections needed here?

/Answer/ There is an obvious absurdity here. Plots must be strengthened, not dismantled. As it is, they are maintained with the enthusiasm of devotees. Without receiving accurate descriptions of a variety from them, we will not be able to program the harvest. It seems that the time has come to pay for the testing of varieties. Then neither the selection center, nor the experimental station in the chase after high indicators and bonuses will take the risk of shoving under obvious omissions.

As you see, some complications go away and others, no less acute, appear. We will also overcome them, because yield programming is not the last word in fashion, but the vital need of modern agricultural science. As facts accumulate, new principles will be formulated and obsolete ones will be discarded. A rise in the standard of farming and the development of qualitatively new varieties will enable us to obtain superhigh harvests in the future.

This year this work will be expanded on 3 million hectares, primarily on reclaimed land, which as yet does not give the proper yield from the vast funds invested by the state.

The principles of programming, mathematics and the methods of this work must be studied at agronomic faculties right now. Instrument builders face a great deal of work, because a large number of the most diverse sensors, moisture meters, lock pins and other equipment capable of following the state of plants will be needed soon.

Is this expensive? Of course. But this is not a burden on the economy of farms. The share from the increased harvest attained will be sufficient for programmers.

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## TILLING AND CROPPING TECHNOLOGY

### PROGRESS, PROBLEMS IN HYBRID SUNFLOWER CULTIVATION

Moscow SEL'SKAYA ZHIZN' in Russian 28 Apr 83 p 2

[Article written by V. Svyatko, director of the Selektsiya NPO [expansion unknown] for Oil-Bearing Crops; Yu. Buryakov, candidate in agricultural sciences; and A. Lukashov, chief of the department of agriculture at the All-Union Scientific Research Institute for Oil-Bearing Crops [VNIIMK]]

[Text] To attain the goals set forth in the Food Program, kolkhozes and sovkhoses must harvest at least 6.6 million tons of sunflower seeds this year, which is a 24 percent increase compared to the 10th Five-Year Plan. This goal can only be reached by a complete and efficient use of all reserves.

Most important in this effort is the biological potential inherent in the many hybrids and high-yield varieties. This year the following varieties will be used for the first time: pochin, odesskiy-91, soldor-220 and sanbred-254; some 470,000 hectares will be planted with these varieties. As a rule they are fast-ripening, morphologically similar, resistant to white and gray mold, and good for harvesting.

Hybrids do well in cooler years and also during severe summer droughts. In 1982 they yielded 20.8 quintals of seed per hectare from a total area of 200,000 hectares, 3.6 quintals greater than the yield of ordinary varieties. To attain these high yields from hybrid sunflowers, there must be complete and timely applications of fertilizer and herbicides, and high quality field work.

The varietal supply is improving. Acreage given to the progress, start and yubileyniy-60 varieties is increasing, especially in those areas where broomrape and downy mildew are common. Here the optimal mixture of hybrids and other varieties depends on their ripening times.

Each farm must then sow not just one variety or hybrid, as in the past, but two or three with varying vegetative periods.

Equally important is the exclusive use of calibrated tetramethylthiuram- or fentiuram-treated seeds. To keep planting material and shoots free from the click beetle and other diseases in the soil, the seeds must be treated with a 90 percent solution of industrial gamma-isomeric hexachlorocyclohexane,



4 kg per ton. Inlaid treatment is the best method: primary treatment with a subsequent film-forming layer on the seeds.

Experience of recent years shows that the main factors assuring reliable sunflower seed production are the use of scientifically based agricultural methods and precise observance of technical practices.

As a result, average yields of sunflower on farms in Glubokovskiy rayon of East Kazakhstan Oblast were 20.8 quintals per hectare in 1982 and 21-22 quintals in Saratovskiy rayon of Odessa Oblast, Telmanovskiy rayon of Donetsk Oblast and Pokrovskiy rayon of Dnepropetrovsk Oblast. Farm workers in the Kuban region also attained high yields on those large farms. In Yayskiy, Starominskiy and Shcherbinovskiy rayons seed yields of 24.8-25 quintals per hectare were reached.

The effects of unfavorable weather can be mitigated by precise observation of technical procedures. This year the amount of land given over to this valuable commercial crop under conditions of industrial technology will increase by 400,000 hectares, almost one-third of the entire amount of land planted with sunflowers. Therefore, reasons for control on the part of agricultural organizations have never before been so important, control over the way farms adopt new methods and observe technical procedures. Indeed the three-year experience with large-scale industrial technology has proved its great efficiency. Last year a hectare that was worked under industrialized technology yielded an additional 5.2 quintals compared to a normal hectare.

Yields of sunflowers per hectare under traditional methods depend on the timeliness and quality of all field operations. Weeds must be thoroughly controlled with post-planting operations and with harrow work on rows both before and after the appearance of shoots. Supplemental work groups man the equipment used in these operations, and wide-disked equipment is most effective. To reduce harvest losses caused by broomrape, downy mildew, sclerotinia, gray and ash mold and other diseases, sunflowers must be regrown in the crop rotation no sooner than 8-10 years.

Fall application of mineral fertilizers on sunflowers have been inadequate in many areas. This can be rectified by a localized conveyor application of mineral fertilizers, 40-60 kg of nitrogen and 60 kg of phosphorous per hectare. It is important to spread the fertilizer by a double or single belt method, a distance of 6-10 cm from the seeds and at a depth of 10-12 cm. On those fields that have not received fertilizer applications in the fall or which have recieved a localized conveyor application in the spring, a necessary operation in damp areas, there is an additional fertilization on every two-three true shoots--a compound liquid fertilizer or solution which has been freshly prepared on the farm (manure swill with mineral fertilizer). But this supplemental fertilization will only be effective when a 20-30 kg mixture of nitrogen and 30 kg of phosphorous is applied, when this mixture is worked in by two belts at a distance of 10-12 cm from the row and at the above-mentioned depth.

Commercial compound liquid fertilizers have an undesirable mixture of nitrogen and phosphorous (1:3.4) for sunflowers. It is therefore necessary to

readjust this mixture to the most optimal one for sunflowers (1:1.5 or 1:1), adding urea, ammoniac nitrate or fluorite to the compound liquid fertilizer.

Field work at the present time aims at maximum preservation and efficient use of moisture. Combines and wide-disked equipment should be used in working the soil before planting. Evaporation of soil moisture can be reduced by loosening the planting layer with harrows or sweep harrows, carefully leveling the surface and planting immediately after the preparatory work.

On well-plowed autumn fields the leveling work should be done only with normal harrows or the VP-8 leveler; also with harrows having welded segments in one pre-planting treatment.

The most important element of industrial technology is the use of high-yield hybrids calibrated for field conditions. We should not expect weeds to be controlled by use of herbicides in unripe fields, when the winds are strong, or when time elapses between planting and herbicide application. This year the principal herbicides will be treflan and its analogue nitran, also prometrin and eptam.

It is extremely important to obtain maximum plant density. Yet when there is little soil moisture and the plants are densely sown, sunflowers can extract all of this moisture during the first half of vegetation; by the time of flowering and ripening the plants could be short of water. This can be prevented by determining the moisture content of each field; once this is known, crop densities can be determined.

Many farms, unfortunately, don't pay enough attention to constant soil depth for sunflower seeds. Four-year statistics from the VNIIMK show that uneven planting depths from 4-12 cm translate into a 3.0-3.5 quintal reduction in yields per hectare compared to an even planting depth of 6 or 8 cm.

Up until the last week of April sunflowers were planted on 2.9 million hectares. Shoots of early-ripening varieties are appearing in southern regions. Cold weather has somewhat delayed their appearance but hasn't prevented weed growth. Under these conditions precise planting work is all the more important. On those fields worked under conditions of industrial technology, where weeds have been completely controlled by herbicides, there should be a single inter-row cultivation at a depth of 5-6 cm with a simultaneous use of weed harrows to destroy such growth in controlled areas. Tillers can be used for late-growing weeds, while additional harrowing can be used for those weeds resistant to treflan.

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## TILLING AND CROPPING TECHNOLOGY

### COMPUTER MODELING OF SUNFLOWER CROP

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 12, Dec 83 pp 26-27

[Article, under the rubric "Main Theme of the Magazine--Harvest Progress and Forecast", by V. Stratan, candidate in agricultural sciences: "Computer Modeling of Sunflower Harvest"; topics are: Main Agricultural Principle, "Equalization of Weaker Links", Joint Optimization of Harvest Factors, Forecasts by Modeling]

[Text] Analysis of harvest conditions is extremely important for contemporary agriculture. Mathematical methods that analyze various factors and modeling of crop growth under various weather conditions remain the most important elements in determining agricultural yields.

Our factor analysis shows that a change in one parameter without considering optimization of other factors will not have a significant influence on the harvest size, but will at times result in an unproductive use of the land's economic potential. Assembling production and other data from the MSSR state variety network shows that all variables included in the multivariable linear regression should be mutually dependent, that is, correspond to those optimal conditions for plant growth which would ensure the planned harvest.

Violation of variables' dependency will inhibit the growth in the harvest of sunflower seeds. For example, an increase in precipitation during vegetation from 215 to 442 mm will have almost no effect on yields of this crop (16.4-17.6 quintals per hectare). This is because we estimated the variable "plant nourishment" as not being dependent on soil moisture.

A factor analysis of the harvest on kolkhozes, sovkhoses and specialized plots in the republic shows that an efficient use of the potential inherent in cultivated and hybrid varieties of sunflowers is possible only when the basic agricultural principle that we have formulated is followed: the principle of correlation among the main variables in plant growth.

The fact is that both deterministic and non-deterministic variables are among the basic factors. Those decisive conditions for plant growth under different weather conditions can only be determined by estimating the dependency of these variables. A simple optimization of individual parameter significance--the usual procedure--will, unfortunately, prove a lack of correlation among the factors and will thus mean a reduced harvest.

The basic principle is met with most often on those farms where experienced specialists are working.

By establishing the correlation between such variables as nourishment and plant depth with soil moisture and optimal temperature, seed output and test weight of 1,000 kernels both increased. As a result, yields of sunflower seeds reached 28.2-29.9 quintals per hectare and oil yields 1,771 kg per hectare. Where this dependency was not taken into account, seed yields did not exceed 13.4-14.8 quintals per hectare.

Our research shows that when this basic principle of agriculture is observed, the dependency of the harvest on the main variables greatly decreases, that is, the crop conditions are satisfied--a larger harvest. And, on the other hand, increased dependency on the main variables means that some of them are lacking; here there is a reduced harvest. We discovered this phenomenon and call it "the equalization of weaker links"; it has played a significant role in determining the joint optimization of the main variables.

Joint optimization--the determination of correlation between the main variables (soil moisture, fertilizer, plant density, planting periods, etc.) and the weather. In other words, we set up the deterministic conditions for plant growth for the planned harvest in accordance with this main principle of agriculture.

Given current levels of science and technology, it is impossible to model the harvest on the basis of just one or two parameters. This would mean discounting the dependency among other variables, leading to an inefficient use of the parameters (for example, application of fertilizer without consideration of useful soil moisture, plant density and current weather conditions) and a violation of the main principle of agriculture. Present levels of production call for an integrated approach in planning the harvest size. This is particularly true for sunflowers.

A correct modeling of conditions for plant growth is necessary in making a benefit analysis of this crop; that is, the conditions must be computer modeled.

Modeling is based on "equalization of weaker links", joint optimization and the main agricultural principle. Correct modeling of the sunflower harvest is done as follows: on the basis of the average harvest on kolkhoz or in rayon for the past five years, taking the weather conditions into account, the corresponding harvest growth can be calculated. Quantitative values for the variables are chosen and, using a simple model, they are run through on the computer. Our output is a high joint optimization of variables.

In such a case where we cannot attain the required joint optimization of variables, we must correct for the planned harvest size because the harvest estimate is unattainable under the specific conditions.

We chose four out of the 30 models that were run; these four have a maximum optimization of variables, 91.1 to 97.2 percent, and the greatest planned yield of sunflower seeds, 26.4-30 quintals per hectare (see table).

Modeling of conditions for harvest of sunflower seeds

Average value of harvest  
variables for plant growth

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
323	206	1501	453	76.8	26.4	0.089	0.298	2.45	91.1
373	206	1750	453	76.8	27.8	0.030	0.172	1.33	97.0
270	296	1501	453	96.8	29.0	0.028	0.169	1.30	97.2
441	206	1750	453	96.8	30.0	0.087	0.295	2.42	91.3

note: the number of observations in each model is 70

Key:

- 1) precipitation, mm
- 2) mineral fertilizer, kg of active ingredients per hectare
- 3) sum of efficient temperature greater than 5° C
- 4) plant density per 100 meters<sup>2</sup>, number of plants
- 5) seed weight per calathide, grams
- 6) harvest, quintals per hectare
- 7) D, coefficient of determination
- 8) R, multi-correlation coefficient
- 9) MR, confidence level of R
- 10) percentage of parameter optimization

From the above figures it is clear that the necessary optimization of harvest variables will not occur at precipitation levels of 323 and 441 mm; it is low here, 91.1 and 91.3 percent. Average precipitation levels of 270 and 373 mm yield good results. Optimization of variables for these models is high--97 and 97.2 percent--and the expected harvest of sunflower seeds is 27.8-29 quintals per hectare.

Experience has shown that there are crucial periods in plant growth which can be used to determine the size of the upcoming harvest. Some 50 percent of the harvest can be attributed to favorable spring weather--temperature and rainfall. Because sunflowers are raised under methods of industrialized technology and because most of the variables in the initial period will not change later on, then all correction factors in modeling for this crop's growth need only to be incorporated in the spring.

Harvest modeling and subsequent forecasting remain a very real problem. They can ensure favorable conditions for plant growth and an efficient use of natural and economic factors, and can formulate planned harvest size.

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## TILLING AND CROPPING TECHNOLOGY

### FURTHER DEVELOPMENT, INTRODUCTION OF HARVEST PROGRAMMING URGED

Moscow SEL'SKAYA ZHIZN' in Russian 13 Dec 83 p 2

[Article by N. Bondarenko, academician of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin, chairman of the coordinating council for harvest programming, and A. Petrov, director of the support center of the Agrophysical Scientific Research Institute, RSFSR honored agronomist, Hero of Socialist Labor: "Harvest According to a Program"]

[Text] For a long time, prior to sowing a certain crop, long before the sowing campaign, experienced farmers used to carefully weigh their possibilities, to take into consideration the fertility of soil, the quality of seeds and the characteristics of a variety and to determine on the basis of popular signs general weather forecasts for the next summer in order to act with certainty and obtain the most substantial harvest. It must be stated that they were rarely wrong.

There are also many such people in rural areas nowadays. However, what previously was the lot of individual people, today can be placed on a mass basis and dressed in strict mathematical formulas. Today it is possible to develop a detailed, scientifically substantiated harvest plan for large modern production, which makes it possible to most efficiently utilize the available resources and, at the same time, to attain the maximum result.

Agricultural practice urgently sets complex, new problems for science. It is precisely science that must help to accurately calculate the following with respect to any field: What harvest can be obtained under given specific soil and climatic conditions and with what probability? How much water and how many fertilizers and plant protection agents will be needed to grow it? When should specific operations be carried out and how? There are many such questions and all the answers to them require an overall approach and an all-around consideration of the effect of natural factors affecting the growth and development of plants.

The problem of construction of integrated models quantitatively describing the entire set of processes occurring on a specific crop rotation field pertains to the most complex problems in agricultural science. Nevertheless, even on the basis of a simplified description of the interaction of the basic factors in the production process it is possible to ensure the production of high harvests with due regard for the economic advisability of all the implemented

measures. This involves harvest programming, which has been used in both our country and abroad for several years. It presupposes the transition to a farming practice more carefully taking into consideration the effect of basic soil and climatic factors on the harvest and envisaging a differentiated application of agrotechnology in accordance with the characteristics of a certain field and changing weather conditions.

Harvest programming is not some well-defined one-time measure, but a constantly operating and developing scientific and experimental production system of agricultural management utilizing the entire sum of modern knowledge of the methods of analysis of farming calculations and techniques. At the same time, the amount of the potential yield is determined according to the quantity of photosynthetic active radiation, the provision of crops with moisture and heat and the fertility, quality index and microclimate of soil and a calculation of optimal doses for fertilizer application is given. Technological maps including all the agrotechnical measures on a given field with due regard for its characteristics, the dates and methods of their fulfillment, their prompt corrections in connection with the formed weather conditions and so forth are also compiled. Programming also presupposes an accurate computation of the harvest from every field and a detailed analysis of the reasons for the deviation from the given program.

For example, in Leningrad Oblast some farms have used it from the beginning of the 10th Five-Year Plan. It is most extensively organized on the sovkhozes of the specialized Krasnaya Baltika Production Association, where a permanent support center of the Agrophysical Scientific Research Institute operates. The total area of programmed crops on all five farms in the association has exceeded 7,300 hectares. Perennial grass, potatoes and spring grain crops are grown.

Workers at the support center process all the information on harvest programming received from farms, prepare the necessary documents and conduct explanatory work with direct executors. In classes in the agricultural training system during the winter period technological maps and their fulfillment are analyzed in detail and agrotechnology is studied.

On the association's farms control over the implementation of every programmed measure is intensified and the responsibility for the observance of the required depth of plowing and placement of seeds, periods of performance of operations, uniformity of fertilizer application, quality of harvesting and so forth is high. The association's head sovkhoz gives the tone. A total of 44.2 quintals of grain, 160 quintals of potatoes and 4.2 quintals of seeds of perennial grass per hectare were gathered there last year. Largely owing to programming, high harvests have also been obtained now.

The yields of agricultural crops envisaged according to the preset programs have also been obtained on the fields of the Petrovskiy State Pedigree Plant and the Belogorka Scientific Production Association and on Krasnyy Oktyabr', Detskosel'skiy and Ruch'i sovkhozes in Leningrad Oblast.

However, can it be stated that this method has already been mastered and its development has been completed? Of course, not. Even on the best farms without constant and strict control on the part of specialists and managers over the observance of technology disruptions begin immediately and errors in work and a "free" attitude toward the established program appear. The reason lies in the insufficient educational and training work with brigade and link leaders and direct executors of work. As life has shown, it is very difficult to change the deep-rooted psychology and to get rid of such arguments as "give more manure for fields and your calculations will not be needed," or "why does the agronomist need a program? It suppresses his initiative." How far from the truth are all those who think so! Harvest programming presupposes profound knowledge and ability and their complete application in daily practice on the part of specialists in order to envisage everything in advance and not to correct mistakes on an emergency basis later on. As academician D. N. Pryanishnikov stressed, excessive fertilizer doses on fields will not make up for the lack of knowledge and ability.

Sometimes a "blind" resistance is felt on the part of production managers themselves, who seemingly should be especially interested in an increase in land productivity. In fact, however, there are fears that harvest programming can lead to an increase in the plans for the yield of all crops. What can one answer to this? Plans should be realistic and an efficient program built on objective data is just what is needed in order not to overestimate assignments without substantiation, as it often happens, but to establish them on the basis of the strictly realistic possibilities of every farm, brigade and field.

Finally, many refer to the shortage of resources and equipment necessary for the creation of optimal conditions for the growing of harvests. Well, the program also takes into consideration such cases, gives an unprejudiced evaluation of farm capabilities and shows the ways of the most efficient utilization of available resources depending on the actual existence, combination and interaction of various factors.

Of course, a great deal in the utilization of the programming method also depends on the scientists themselves and on its developers. The preparation of these programs is still laborious and labor intensive and requires considerable efforts and versatile knowledge. Meanwhile, there is a shortage of specialists in this area. A course in harvest programming was introduced at some higher agricultural educational institutions, including at the Leningrad Agricultural Institute, only 2 years ago. The calculation method itself needs to be improved. On many farms it is still performed manually, although computer equipment making it possible to sharply speed up this work is needed here as nowhere else. Only by means of computers will we be able to widely change over to a flexible programming system necessary for taking into consideration the constantly changing conditions of the natural field situation. Different variants of decisions made with due regard for weather phenomena, existence of equipment and so forth are needed often.

Harvest programming is a territorial matter. It is to ensure a successful realization of goal oriented programs in a certain region for the growing of certain crops--grain crops, cotton, potatoes, vegetables, fruit crops and so

forth. We still have a lot of work here. Since the set of measures connected with programming is always implemented as applied to the characteristics of a specific crop rotation field, the most efficient method of "attachment" of the entire scientific baggage--republic, oblast and regional farming systems--to the conditions of specific farms and rayons is examined here.

The provision of our sovkhozes and kolkhozes with equipment and fertilizers and regionalized highly productive varieties of field crops increases, land itself improves and its fertility rises every year. All this enables us not only to forecast the harvest, but also to construct it accurately and in stages, while controlling the growth and development of plants, and, ultimately, to always obtain the highest result possible under given specific conditions.

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## FORESTRY AND TIMBER

### MANAGEMENT OF TAIGA TIMBER RESOURCES OF KRASNOYARSKIY KRAY

Moscow SEL'SKAYA ZHIZN' in Russian 17 Feb 84 p 2

[Article by P. Zinkeyev (SEL'SKAYA ZHIZN' correspondent), Krasnoyarskiy Kray: "The Taiga Has One Boss"]

[Text] Procurement, hauling and sale of so-called commercial timber are the three life-giving roots that give life to any typical lumber enterprise. The Yemelyanovo Lespromkhoz [integrated logging-lumbering enterprise] is no exception. For 40 years, it felled trees, hauled and cut logs, selecting (alas, that is what was done in the forest exploitation system) the best conifer species, leaving the topwood, stumps and trunk bases to rot in the taiga forest. They simply had no use for them, the waste, as well as for aspen and other deciduous varieties, mentioning their poor grade that would not yield the desired increment on the records, under the heading of "gross output." No thought was given to reforestation, with reliance on the forestry administrations, as if thinking that seedlings are readily available to them!

Incidentally, there is a forestry administration in their neighborhood, in the same village of Pamyati 13 Bortsov [In Memory of 13 Fighters]. It has its own machinery, sawmill and vehicles, which are intended for plantings, clearing cutting areas, chopping leavings and processing the obtained raw material. But the capabilities of the neighbors are far from equivalent. While they enable the Lespromkhoz to deplete the taiga by hauling lumber worth 4.2 million rubles per year away from there, the forestry administration, which is the real boss of the forest according to its status, performs work worth only 350,000-400,000 rubles. One tenth as much! And this situation exists everywhere.

But it has now become apparent that in both the central Russian groves and forests of the Urals, as well as the Siberian taiga, there should not be numerous bosses, and it is high time to have a single one, one who is zealous, with full control of natural resources, their wise use and restoration.

The forecasters of such bosses are the six experimental and testing organizations for exploiting forests, which have been established in the nation. One of them is the Yemelyanovo Lespromkhoz in the Siberian Scientific-Production Lumber Association. The idea is to combine the efforts of all services dealing with work in forests. The objective is to make intensive and full use of all resources of the taiga without exception, total restoration of natural resources removed from it. In other words, it is allowed not only to take everything



for a good purpose, but to return it with interest, lest there be a loss. Neither now nor in the future.

The first 2 years of working in the new way have gone by. This is no time at all for restoration of trees; a conifer requires at least 100 years to reach full maturity suitable for chopping and deciduous trees require 60 years. So that there is simply no question of discussing changes in this respect, although the range of duties performed by the forestry administration to restore the forest has now become absolute for everyone. As before, protection of the taiga is managed by the forestry workers. However, woodcutters have begun to pay attention to it also, for this indicator is now listed in the general inventory of their enterprise. This means that the attitude has changed and watchfulness has increased. There is also the chopping of waste, which had previously been done only by the forestry administration. It has become easier to cope with this, since the capabilities are different, the Lespromkhoz has more powerful equipment. The same applies to reforestation. There is poor compatibility of the schedules for procurement of timber and reforestation; there is an extremely high-intensity season for the former--the winter, and for the latter it is the summer. And now, the common interest has come to the rescue, due to the structure of the integrated enterprise. It is much easier for them to take care of 500 hectares of scheduled reforestation together, whereas formerly it was such a difficult job for the forestry workers.

As for efficient use of timber resources, the advantage here is unquestionable. As before, so-called commercial timber is the principal product of the taiga. There cannot be two opinions on this score: mature trees must be cut down, they must not be left to stand beyond their time, otherwise the forests would become transformed into a jungle and a public asset would perish. So that, with the new structural form of enterprise also, logging will remain the chief source of income. But, and this is very important, it is far from the only one. In the 2 years of its existence, the experimental Yemel'yanovo Lespromkhoz has constructed a shop to manufacture consumer goods. It is mostly the wood from chopping leavings that is delivered there. Sometimes it is quite unattractive, and the forestry administration simply dumped it on a plot of land. Now every branch, even the smallest one, topwood, stumps and trunk bases are utilized.

When we visit the shop we see that it is spacious and light, but at the same time exceptionally simple in its furnishings and equipment. Diverse wood refuse comes here (to use the customary expression), and needed goods are made from it. In 9 months of its existence, the shop has put out hundreds of cubic meters of pickets, 30,000 turned handles for shovels, lots of finishing boards for tables, 4000 woven baskets; there goes a planed board for covering walls, a strip for flooring and many other items. The cubic meter of lumber from chopped waste that has gone through this shop now yields 120 rubles gain, versus the previous 15 rubles.

And this is not all! The integrated enterprise has set the goal of improving secondary use of the timber, to increase the collection of crude timber raw material, mushrooms and berries, nuts and other resources of the taiga. Neither the forestry administration nor Lespromkhoz had done this before. A start has

been made. A wood chemistry enterprise has been organized. A total of 90 tons of pine resin has been recovered. The goal has been set of producing up to 5 tons of pine oil. This means that not a single branch of spruce will be thrown away: 100 kg spruce is needed to recover 1 kg oil. A line has been started up to process commercial chips, which are excellent primary raw material for wall covering--arbolite. As we see, all the conditions are being provided to take as much as possible from the forest, but without detriment to it. And they are succeeding in so doing.

V. A. Manakov, general director of the Siberian NPLO\* maintains that: "There is an enormous need of integrated, permanently operating timber enterprises. Even in Siberia, since the great taiga of Siberia also consists of small plots, on which mature stands emerge, and they are usually of the most valuable species. Other lespromkhozes abandon less valuable ones, for example, aspen. Yet it is good raw material for carpentry items, fencing, various lining materials and consumer goods."

There are large stocks of timber on the Yenisey meridian: every fifth tree of our country grows there. But it is growing increasingly difficult to reach these trees. Mountain ridges and swampy floodplains are in the way of forest developers and require considerable additional expenditures. On the other hand, are we utilizing fully closer resources? By no means not. At present, 18 million cubic meters of timber is cut down annually in our kray. Of this quantity, there is the following waste: 1.8 million cubic meters in felling areas, 2.3 million from logs, 0.9 million from log trimmings and 2.7 million from sawing ties and timber.... Could all this be used? Of course it could. Almost 4 million cubic meters are now being processed, and the rest, alas, is converted into rubbish for the dump and burned. The reason for this is bureaucracy in forest utilization and slow development of the rear areas for timber processing.

Incidentally, bureaucratic alienation harms the forests most of all. The taiga of Yenisey is no exception, from which timber is recovered by more than 600 enterprises belonging to more than 30 ministries and agencies. Each has its own "by-laws," its own principles and, of course, its own customs. And this is what happens: one agency chops a tree and takes commercial lumber, discarding stumps and spruce; another, as it chops down a tree, discards the timber and hauls away what it needs to weave baskets....

A special-purpose program for integrated utilization of timber resources adopted in this kray will eliminate such paradoxes. It provides, first of all, for having the lumberjack become a unique type of taiga corpsman, who gathers mature and long-standing trees and replaces them with young stock. It will become possible to create a "permanent lespromkhoz" with an inexhaustible base of raw materials. There is the knowhow in this kray: the Abaza Lespromkhoz in the Khakass Autonomous Region, where new tree-felling work could be started in 30 years in areas that had already been worked. The Kanskiy experiment was also very beneficial. There, the kray's first integrated association was formed of 12 scattered enterprises on the principle of "cutting area--ready product." This was the start of a job that has a future.

In brief, a start has been made in overcoming the bureaucratic barrier.

\*Scientific-Production Lumber Association.

## FORESTRY AND TIMBER

### USE, CONTROL OF KARELIAN TIMBER RESOURCES EXAMINED

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[Article by M. Yeminen, minister of justice of Karelian ASSR, and Ye. Shchipurzhitskiy, chief of juridical section of Karellesprom VPO (All-Union Industrial Association): "Are Timber Resources Being Used Effectively?"]

[Text] Each year some 13 million cubic meters of timber are procured in Karelia. Postwar logging has exhausted her forest resources considerably, while the requirements for timber resources grow each year. This is why the struggle for economic and rational use of these resources now has acquired special acuteness.

Forestry entities perform a survey of the correctness with which timber areas are logged, with attention given to observance of standards of forest legislation and if necessary property penalties are levied against violators.

Leaving harvested but unhailed timber in a felling area, incomplete cuttings, conversion of commercial timber into firewood through irrational cross-cutting, destruction of young stock, unauthorized (arbitrary) logging, and so on are facts which indicate irrational use of forest resources.

Just how are the results of the survey of felling areas determined at the present time?

In 1981 the logged forest area in Karelia was over 80,000 hectares. Naturally it is practically impossible to determine the observance of forest legislation and rational use of forest resources by a continuous inspection of such colossal areas. Therefore forestry entities perform this work selectively by establishing sample (control) plots and then extending the results of their survey to the entire logged territory. It must be pointed out here, however, that there is a varying procedure in determining the percentage ratio of sample plots to the entire logged area not only in different forestries, but also in different samples established by one and the same forestry.

In 1980 the Yushkozero Forestry brought an action for a sum of more than 70,000 rubles against the Yushkozero timber management for forest violations. The extent was determined by the plaintiff by establishing sample plots ranging from 2.9 to 15.3 percent of the total felling area, and this range contained 23 variants.

The cited disparity in determining the percentage of sample (control) plots to the total felling area arises because of the absence of a uniform approach in resolving this matter.

From the standpoint of statistics theory, a sampling observation represents that form of noncontinuous observation in which there is a survey of a portion of the units of the subject population, chosen on the basis of specially developed scientific principles which permit obtaining data on the selected portion for describing the population as a whole. With nonobservance of scientific principles of sampling, let alone in their absence, the results of a sampling observation not only do not provide an objective assessment of the entire population but, to the contrary, they distort it.

In a letter No 3-19/560 dated 29 November 1979 the RSFSR Ministry of the Forestry Industry established that for an inspection of logged areas sample plots should be established amounting to 8-10 percent of the felling area (allotment), guided by the USSR Manual for Allocation and Assessment of Felling Areas in Forests of the USSR, adopted by the USSR Gosleskhoz [State Committee for Forestry] on 27 December 1968.\* Meanwhile, the very same ministry previously believed that the size of sample plots must not be less than 15 percent of the felling area.

Reference to the Manual as a basis for determining the size of sample plots draws attention. Meanwhile, Paragraph 1 of the Manual notes that it is used in the allocation and assessment of felling areas before the beginning of logging. In our view, the RSFSR Ministry of the Forestry Industry's determination of the size of sample plots for inspection of felling areas after logging with a reference to the Manual is erroneous not only based on formal criteria, but in essence as well.

The completed logging of a felling area is nonuniform in its conditions. Here there are "paseki" (areas where only logging was carried out), skidding areas (where logs were skidded by dragging them through the plot, which involves destruction of seedling growth), places where knot saws operated and where it may be especially littered with branches, places where trimmed logs were stacked, and so on. Each of these areas has a characteristic condition after the completion of logging. These circumstances were not considered in the Manual inasmuch as it had a different task.

The methodology by which the sample plots were established is of no less importance than proper determination of their percentage. After the completion of logging it is very difficult to find an area in the cut which would characterize in miniature the quality with which the entire felling area was worked for a substantiated conclusion as to the extent to which loggers observed standards of forest legislation (and in case of their violation, for proper application of property penalties).

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\*From here on it is referred to as the Manual.

National economic interests require that an estimate of the rational use of forest resources be based not on arbitrary, subjective methods (where as a result the estimate is determined tentatively), but on a scientifically grounded methodology established under a standardized procedure. This also will contribute to a consistent application of the cost-accounting principle in conformity with which the extent of responsibility of the forest user must be equal to the extent of infractions he commits.

This question gained particular urgency in connection with the introduction as of 1 January 1982 of new Rules for Releasing Standing Timber in Forests of the USSR, approved by USSR Council of Ministers Decree No 1045\* dated 30 October 1981, which envisage an increase in the amount of property penalties for individual infractions and also establish liability for new kinds of infractions.

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\*SP SSSR [USSR Collection of Decrees], No 33, 1981, Article 184.

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